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ABSTRACT

This is an annual report from a foundation whose principal goal is the development of practical alternatives to the traditional methods of educating children and training teachers. In addition to financial statements, articles are presented which describe the foundation's activities in several areas: (1) an assessment of National Follow Through, (2) a developmentally valid preschool curriculum, (3) a cognitively oriented bilingual program, (4) early childhood education in Latin America, (5) home visitation by educators to parents, (6) a generative approach to the writing and producing of plays by children, (7) the difference between operative and figurative thought, and (8) data processing improvements at High/Scope. (DAG)

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Report 1975-76

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High/Scope

Educational Research Foundation

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FACTS ABOUT THE HIGH/SCOPE FOUNDATION

Origins

The High/Scope Educational Research Foundation is an independent, non-profit organization with headquarters in Ypsilanti, Michigan. The Foundation began full-scale operation in July 1970. Members of the staff have been involved in early childhood education projects since 1962; the initial projects were funded primarily through the Research and Development Department of the Ypsilanti Public Schools.

Purposes

The principal goal of the Foundation is to develop practical alternatives to the traditional methods of educating children and training teachers. To this end, the Foundation engages in curriculum development for infancy through the high-school years; operates a laboratory school and conducts workshops and seminars for the training of teachers; conducts evaluative research for its own and others' educational programs; conducts professional conferences; and produces multimedia training packages to supplement face-to-face teacher training.

Activities

○ *Infant Education*—Since 1968, the Infant Education Department has been developing a parent-infant education program and training materials for home teaching with parents and infants. The Ypsilanti-Carnegie Infant Education Project (1968-1971) was one of the nation's first experimental research studies on the impact of home teaching. During the Infant Videotaping Project (1971-73), department staff conducted a second home-teaching program and recorded the sessions on videotape. From the 270 hours of documentary footage, the staff produced a series of instructional television programs on infant development, parental support of early learning and home-visitor training.

With the support of the National Institute of Mental Health, the third phase of the Infant Education Department's long-term program plan is now underway—a three-year project in which a group of mothers who had participated in the Carnegie Project are trained in the parent-infant program and conduct home visits with families in the local community.

○ *Preschool Education*—As a sponsor in the national Planned Variation Head Start project (1969-1972), the Preschool Department brought the Cognitively Oriented Preschool Curriculum to Head Start centers in diverse communities.

Preschool Department staff are now operating, in Ypsilanti, one of the National First Chance Demonstration Preschools for the Bureau of Education for the Handicapped. In this program, three-, four- and five-year-olds with physical, mental or emotional handicaps are integrated with a group of nonhandicapped youngsters; the purpose of the integrated classroom is to support the children's cognitive development rather than concentrate on their handicaps.

Through the Project for the Preparation of Preschool Specialists, Preschool Department staff are developing an inservice training system for early childhood centers interested in building cognitively oriented programs. Under a grant from the Office of Child Development and in collaboration with the Detroit Public Schools, the department is developing a bilingual/bicultural preschool education model for nationwide use by Head Start and other early childhood programs.

○ *Elementary Education*—The Elementary Education Department continues to develop the Cognitively Oriented Elementary Curriculum, based on educational principles derived from the child-development theories of Jean Piaget. The department provides consulting and training services to schools and school districts that wish to provide cognitively oriented education. A three-year project to establish a staff development and training program in the Elementary Curriculum is now underway in Region 4 of the Detroit Public School System.

Since 1968, the Foundation has been an educational model sponsor in the National Follow Through Project of the U.S. Office of Education; the Elementary Education Department's services currently reach some 3000 children in 150 Follow Through classrooms.

○ *Training and Curriculum Development*—Much of the Foundation's work in teacher training and curriculum development is carried out in two laboratory schools—the Elementary & Middle School and the First Chance Demonstration Preschool. Here curriculum ideas are generated and tested in practice. Teachers and students of education from many countries come to these centers to observe, to practice and to receive training in the Cognitively Oriented Curriculum.

○ *High/Scope Camp*—The Foundation's summer camp in Clinton, Michigan, is an 8-week nonformal educational program for an international group of young men and women. The program is concentrated in the arts and sciences and physical work. A staff of 15 use the principles of the Cognitively Oriented Curriculum to help the campers design their own projects and take an active part in the life of their community.

○ *Research*—The Research Department is responsible for designing research and evaluation studies, collecting and processing data and evaluating educational programs. These functions are carried out by a staff with skills in the fields of psychology, anthropology, child development, statistics and educational research, backed by data processors, computer programmers, testers and technical editors.

Research Department staff are working on new as-

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High/Scope

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Alternative and National

DAVID P. WEIKART

IN 1968 NATIONAL FOLLOW THROUGH, a program conceptualized as a way of preventing the loss of Head Start gains by disadvantaged children in the elementary grades, was introduced as an intensive, nationally based research project. The fundamental question asked by the study was, If a variety of educational methods are employed, which will be most effective in helping disadvantaged children learn? In order to answer this question, a number of curriculum development groups were invited to submit proposals for participation. Out of this group 14 sponsors of educational innovation were selected, and later the number was increased to 22.

From the start, there was disagreement among sponsors about the assessment procedures to be utilized for this particular study. After the Stanford Research Institute was awarded the national research contract, sponsors were invited to attend a series of meetings to discuss the evaluation strategy. Basically, the SRI staff wanted each sponsor to contribute test items to a pool (as the ill-fated metaphor had it: as petals to a flower), from any available instrument, published or original, that they felt represented the proper assessment of their educational goals. This request was both reasonable and impossible, for several reasons.

Most sponsors, contrary to Office of Education expectations, did not really have a curriculum ready for implementation in kindergarten through third grade. For example, High/Scope's Cognitively Oriented Curriculum had been successfully employed with preschool-age children and in a few kindergarten classrooms, but it had never been utilized above kindergarten and never on such a wide scale out of the direct and personal control of the development

Assessment Follow Through

group.

Even at the start of Follow Through, there was no general sponsor agreement on the goals of education. The sponsors were not developing 22 different ways to produce high achievement on the Metropolitan Achievement Test; they were developing 22 different systems for education and child development. The sponsors' approaches to education formed three basic clusters. One group of sponsors saw Follow Through as the occasion to reform education through the introduction of rigorously controlled and teacher-proof educational systems. The primary focus was upon the transmission of knowledge, with improved performance on the basic skills as the goal. A second group was out of the traditional preschool orientation with a focus upon the development of the human capacities for social interaction and concern about the general ability of children to explore and discover within the context of a relatively open and free environment. The third group saw the child as developing in many areas but especially in cognitive capacity. Their approach was drawn from child-development theory and included the interaction of teacher-imposed structure and child-initiated learning. (There were other clusters of sponsors too, of course, whose primary focus was a method of organization for services such as home teaching.)

When the sponsors from these groups met there was general agreement that the goals of sponsors in the first group, what I call the "programmed learning" group, were more in line with what National Follow Through planned to measure. The other two groups, the "discovery learning" (child-centered) and the "cognitive developmental" (open-framework) groups, tended to see educational outcomes in very different terms from the first group. However, the latter two groups had little to recommend in the way of realistic measurement alternatives at that time. There has been no solution to this measurement dilemma since the initiation of National Follow Through, and current national reports reflect a continuation of these difficulties. Basically, as time has passed, the problem has not been to measure achievement outcomes but to develop methods or systems that would capture the contributions of the various models beyond achievement as conceptualized in the traditional sense.

About four years into the project there was a general reorganization of the assessment battery. Repeated attempts by SRI to come up with alternative assessment procedures such as self-concept measures and useful indicators of classroom performance had not been fruitful. A panel was established by the Office of Education, and from their recommendations a new battery was established. It added a general aptitude measure, the Ravens Progressive Matrixes, and some self-concept and locus-of-control measures and retained the Metropolitan Achievement Test. Also, the use of classroom observation efforts such as that of Jane Stallings at SRI were encouraged. One additional effort was also begun—sponsors were encouraged to establish sponsor-specific research related to the educational goals they held most important. The central problem remained, however: different sponsors held different goals as outcome variables.

Perhaps the most important thing Follow Through sponsors have learned is that the power to test in education is the power to control. By the fourth year, the SRI Battery had ceased to be a passive index of outcomes from many experimental approaches and had become instead an index of sponsor effectiveness on some common dimensions tuned to the traditional goals of education. The Metropolitan Achievement Test and others of that ilk failed to test the issues of educational difference that Follow Through as a program attempted to define. Self-concept, locus of control and dynamic theories about child growth and development were included only as static questions in paper-and-pencil formats.

While the testing battery of the National Follow Through experiment represents a realistic acceptance of what is available in standardized tests, it has almost totally failed to capture the potential for educational innovation that Follow Through as a concept promised. In its limited assessment of educational innovation and movement toward broad child-growth goals, and in its scant recognition of the need for all groups to be better prepared for participation in American society, the battery is a failure, shockingly narrow in its view of the needs of children.

The national study on Cohort II is about to be released, and this report will be followed closely by the report on the main study of Cohort III. These reports are likely to reveal several fundamental inadequacies in the national evaluation. They will document that doing a national study with sufficient scientific control and rigor is extraordinarily difficult. Problems ranging from the assignment of subjects to groups, to questions about whether or not an educational model was in fact implemented, to specific statistical problems in data analysis will plague the studies, making interpretation almost impossible. The studies will also document that the main issues of National Follow Through have been overlooked in the interpretation. Of central concern will be the utilization of the Metropolitan Achievement Test as an index of success—a disaster, of course, because the results of the MAT are not the results of Follow Through. But these MAT data will be used to announce that some models are "successful" while others are "failures" and Follow Through will be dimissed much as Planned Variation Head Start was, without the benefit of the broad consideration it deserves.

But there is another issue. In 1968, when SRI asked the sponsors for input to the national assessment battery, little more than general suggestions could be given about general educational goals and the relevance of certain tests or testing themes to particular curriculum

approaches. Now, however, many of the sponsors have a capacity to define their curricula more accurately and completely. Eight years of curriculum development have permitted much greater clarity of intent and outcome. Importantly, this capacity has evolved through interaction with field sites where the daily confrontation of theory and practice permits the programs to be based on reality rather than assumptions.

Sponsors have also learned to form hypotheses about evaluation within the context of a working model rather than as derivatives of theory. Instrument development separate from working curricular models may be the reason for the failure up to the present time to evolve sophisticated alternative measures. An example from the Foundation's efforts to develop alternative instruments for program evaluation will illustrate this point.

The High/Scope Cognitively Oriented Curriculum is based on the idea that the child generates his own learning within a structure designed and supported by teachers. The dynamic learning situation is drawn from developmental theory, in part Piagetian, and includes materials for the child, support by the teacher to encourage active use of these materials, and questions by the teacher that will extend the child's thinking or underline errors and contradictions in his reasoning. The questions and activities originated by the teacher are not meant to provide the "right way" but to allow the child to reason at the limits of his developmental level.

Now, given this orientation toward education, what are the appropriate criteria for evaluating the program? First of all, the procedure must reflect the experience of the child in the classroom, for to educate one way and assess another is hardly appropriate. It is also necessary that a total testing program be perceived in a broader way than simply as measurement of outcome variables. It must reflect the conditions under which the outcomes were developed. While classroom observations can be summative in nature when defined as necessary conditions for a curriculum or for specific operational goals, usually they are conceived as formative or process assessment. Basically, observation of the "climate" of learning is essential to determining the "cost" of whatever is learned. The story goes that Greek language instruction had to be abandoned in the public schools when corporal punishment was eliminated, for high performance by many pupils in Greek was tied directly to the threat of physical punishment.

In designing what I call a "generative" testing situation, several additional criteria would have to be met. The instrument would have to allow the child to express what he knows in a functional way. He should be able to construct his answers so that they reflect his capacity to think and express concepts. The situation must be supportive of whatever the student produces so that the answers are not either right or wrong, but simply an expression of his best ability. The situation should have supportive elements in it—the student's friends or others with whom he can work, materials with which he is familiar, opportunities to express the strengths of his educational career to date. This format does not call for a sampling of the universe of possible test questions, but rather for a situation in which the student can express his strengths and weaknesses by generating original material. Generative assessment has the student convey his knowledge and abilities by constructing a response that indicates his level of development.

The High/Scope Productive Language Assessment Tasks, the PLAT, is one example of a generative approach to curriculum assessment. It has been developed over the last four years and used at the High/Scope Follow Through sites. It measures the capacity of the child to utilize language as an expression of conceptual ability.

The PLAT battery incorporates two tasks, reporting and narrating. In the reporting task, children are given identical sets of unstructured materials and asked to make anything they want to make. After 20 minutes they are asked to write about how they made whatever they made and are allowed 30 minutes to complete their stories. The children are permitted to interact with one another during all phases of the task. In the narrating task, each child is given a set of relatively unstructured

materials to "help you make up a story." After about 15 minutes of free (and usually dramatic) play on a carpeted floor, the children are asked to write a make-believe or pretend story. As in the reporting task, the children are permitted to interact with one another as they play and write.

Initial processing of the writing samples produces 32 major first-order variables, 16 for each task. Eleven second-order variables are constructed from the first-order variable set during subsequent computer processing.* All but two of these 11 variables are derived by combining reporting and narrating scores. The purpose of combining the two writing samples is to obtain a more representative corpus of individual written language production and, thus, more reliable individual measures.

Initial data from the PLAT suggests that generative testing produces a view of a child's achievement that is different from that obtained by standardized testing procedures. For example, on the California Test of Basic Skills, the High/Scope Follow Through groups usually score somewhat lower than non-Follow Through groups, although occasionally the scores of Follow Through children are higher. However, when using the PLAT the results are considerably different. At the third grade level, High/Scope Follow Through children (N:270) significantly outperform non-Follow Through children (N:175) on 7 of the 11 components of the test. It should be noted that these findings were obtained under a wide variety of field conditions in diverse geographic regions and with children from various ethnic groups.

Correlations of the PLAT variables with standardized intelligence tests and achievement tests produce fascinating results. Correlations between PLAT variables and the Stanford-Binet Intelligence Test indicate that children in the non-Follow Through classes maintain a pattern that is approximately what would be expected between an achievement test and an IQ measure (correlation in the 0.45 to 0.65 range). However, for the children in the Follow Through classes, the pattern of correlations is much lower (0.14 to 0.30). Approximately the same pattern holds for correlations between the PLAT and standardized achievement tests. In other words, the PLAT as a generative test seems to measure capacities of children which are a product of the curriculum. It measures these capacities in an honest manner consistent with classroom experience and in such a way as to tackle the major issues of cognitive functioning.

Is the PLAT a test of language? of writing ability? of capacity to conceptualize? The answer is that it is all of these, but it is also closely related to the actual performance needs of the real world. It is not an attempt at a multiple-choice shadow of that world. It is a test of the ability to produce.

*The 11 variables are fluency, syntactic maturity, vocabulary diversity, descriptive quantity, descriptive density, descriptive diversity, descriptive scope, reporting quality, narrative organization, explanatory statements, and decodability.

While the High/Scope PLAT is definitely not a complete instrument, it does represent the type of assessment procedure that is evolving from the groups of sponsors in National Follow Through who represent child-centered and open-framework types of curricula. It is an instrument that could be utilized widely to tap abilities of children not assessed by regular batteries, abilities that in many respects reflect the highest goals of most educational programs. Instruments of this kind are a major contribution to the national effort to evolve alternative assessment procedures which respect the individual and his culture. Whether the promise of these instruments will be realized is not known, but at least they offer a valid area for extensive development.

High/Scope's experience with generative testing suggests some conclusions about the assessment of National Follow Through:

(1) Basing judgements about the impact of Follow Through on such instruments as the Metropolitan Achievement Test is appropriate only for those models which subscribe to a programmed-learning methodology and its accompanying theoretical assumptions. Continued use of the MAT in assessing the educational impact of all Follow Through programs can no longer be justified on the grounds that it is the only testing alternative.

(2) In the past, instrument development has occurred *within the context of a theory* tested upon a general educational population. It was thought sufficient to attend to statistical concerns in order to fulfill the requirements for a useful instrument. Now that we have data from sponsor-specific instruments, it is apparent that strong new instruments can be developed *within the context of a well implemented curriculum.* National Follow Through represents the development of many such specialized situations and, therefore, affords the opportunity for major breakthroughs in the development of new assessment procedures. This opportunity needs federal-agency backing now.

In 1968, SRI asked for sponsor recommendations with regard to the problem of adequate assessment in National Follow Through. At that time most sponsors were unable to contribute specific information or instruments. It has taken the eight intervening years for sponsors to develop sufficiently valid and useful procedures. It may be that it is too late to alter National Follow Through assessment, but it is not too late to alter our thinking about the potential of curriculum reform in American education, where lack of effective and valid assessment procedures has been a major problem.□

David P. Weikart is president of the High/Scope Foundation. This article is an edited version of a speech he presented in March 1976 at the 53rd annual meeting of the American Orthopsychiatric Association in Atlanta, Georgia.

In our view the role of the teacher remains essential, but very difficult to gauge: it consists essentially in arousing the child's curiosity and in stimulating his research. It accomplishes this by encouraging the child to set his own problems, and not by thrusting problems upon him or dictating solutions. Above all the adult must continually find fresh ways to stimulate the child's activity and be prepared to vary his approach as the child raises new questions or imagines new solutions. In particular, when these solutions are false or incomplete the role of the teacher will consist primarily in devising counter examples or control experiments so that the child will be able to correct his own errors and find fresh solutions through his own actions.

JEAN PIAGET

TOWARD A DEVELOPMENTALLY VALID PRESCHOOL CURRICULUM

BERNARD BANET

THE OVERARCHING GOAL of our work at the High/Scope Foundation is to produce a framework for *developmentally valid education*. The concept of developmental validity makes the assumption that human beings develop capacities in predictable sequences throughout the life span. At each developmental stage new capabilities emerge. Good environments for learning exercise and challenge the developing potentials. Poor environments for learning do not permit newly developing skills to be used, or demand that these skills be employed at a level of competence too far beyond the learner's reach.

Despite the predictability of developmental sequences, human development of course does not produce uniform, predictable outcomes. All people have individual characteristics from birth which progressively differentiate into unique personalities.

Learning always occurs in the context of the learner's unique characteristics. Educational procedures which ignore or attempt to eliminate these characteristics obviously do so with unfortunate consequences.

If there is predictability in the process of growth and change from infancy through old age, that is, *if there are developmental stages*, then it is likely that there are times during the life cycle when certain kinds of things are learned best or most efficiently, and that there are pedagogical methods that are more appropriate at certain times in the developmental sequence than at others.

Given that developmental change is a basic fact of human existence, but that each person is also developmentally unique, and that there are optimal times for particular kinds of learning, developmentally valid education can be defined by way of three criteria: An educational experience, procedure, or method is developmentally valid if it (1) exercises and challenges the capacities of the learner that are emerging at a given developmental stage; (2) encourages and helps the learner to develop his or her unique pattern of interests, talents, and long-term goals; and (3) presents the learning experience when the learner is developmentally best able to master, generalize, and retain that which is learned and relate it to previous experiences and future expectations.

High/Scope's Cognitively Oriented Preschool Curriculum represents an attempt to construct a developmentally valid framework for group experiences for three- and four-year-old children and other children who are functioning at what Piaget calls the "preoperational" level of development. We have utilized the work of Jean Piaget and his colleagues in Geneva as

the basis for an approach to a developmentally valid framework. Piaget's contributions to our understanding of the nature or *content* of thinking in a particular stage of development, and of the *processes* of developmental change, inform the first and third criteria in the definition of developmental validity. On the one hand this theory provides insights into the characteristics of the thinking of the preoperational child, his emerging *abilities* and the developmental *limitations* on his understanding of logic and reality. On the other hand it describes the *processes* that account for developmental change (i.e., how the child moves from one developmental level to another).

American educators up to the present time have had difficulty integrating information about both the characteristics of thinking in a particular stage and about the process of developmental change. It is as if they, like Piaget's preoperational child, find it difficult to focus on more than one aspect of a relation or process at a time.

Thus we see some educators assuming that adults must *teach* preoperational children the logic that characterizes the thinking of children in the next developmental period. They see the child's world view as deficient, and so they proceed to design a sequenced instructional program to move the child more rapidly into more mature levels of functioning.

Other educators have focused on the process assumptions of the theory. They correctly reject the idea of didactically "teaching" developmental change but seem to lose sight of the usefulness of important information about the content of development provided by the theory. We feel that the Cognitively Oriented Curriculum represents important progress toward a developmentally valid framework for preschool education because it integrates these two aspects of the theory—information about both the content *and* the process of intellectual development, the *what* as well as the *how*.

The basic model Piaget uses to describe the process of develop-

mental change* is that of an active subject who gains knowledge by acting upon the world and utilizing feedback from these actions to construct increasingly useful hypotheses about reality, while at the same time abstracting an understanding of "self-evident" logical and mathematical truths. Development is a process of adaptation to reality. New experiences are interpreted in the light of existing hypotheses, assumptions, theories, mental structures.

Piaget has distinguished four major determinants of cognitive development: maturation, experience, social transmission (including language), and equilibration. Equilibration refers to the continual striving for consistency between interpretive structures (assimilation) and new demands to accept new information about the world (accommodation). Experience includes physical experience, through the senses as feedback from active exploration, and logical-mathematical experience, from which logical principles are deduced, unconsciously, through "reflective abstraction." Logical truths, such as the principle of transitivity (if A is greater than B and B is greater than C, then A must be greater than C), are comprehended without formal teaching, but neither is their comprehension something innate; logical-mathematical knowledge is constructed by the child out of many specific actions and experiences. The attainment of logical insights such as number conservation, transitivity, the class-inclusion relation, and the conservation of physical properties despite apparent transformations (transformation of mass, weight, volume, etc.) emerges in predictable developmental sequences, which resist acceleration through adult intervention.

One implication of Piaget's work is that logical-mathematical knowledge is the least "teachable" kind of knowledge there is. This knowledge, however, is *inevitably* mastered by organically intact human beings, at least through the concrete operations level. Acceleration of development through didactic teaching is not a developmentally valid course. If children construct their *own* model of reality, which develops over time in response to new experiences and exposure to conflicting viewpoints, and if acceleration of this development is not a valid goal, what, then, is the role of the teacher in a developmentally valid curriculum?

The teacher is a supporter of development, and as such his or her prime goal is to promote *active learning* on the part of the child. Active learning—the direct and immediate experiencing of objects, people, and events—is a necessary condition for cognitive restructuring and hence for development; put simply, young children learn concepts through self-initiated activity. Such activity, carried on in a social context in which an alert and sensitive teacher is a participant-observer, makes it possible for the child to be involved in experiences which produce the optimal degree of cognitive disequilibrium and hence the impetus for cognitive restructuring. The interests and talents of the child are most readily enlisted when learning is conceived as an interplay of physical action and mental manipulation initiated by the learner.

Learning is decisive and lasting to the degree that it is active and direct, because active and direct experiences engage the senses and the motoric system; they provide the child with the core of understandings around which new knowledge can be built

*Much of the theoretical picture presented here in brief summary is amplified in the article, *Operativity and the Cognitive Unconscious*, in this issue of the *High/Scope Report*.

through less direct means when the child is developmentally more mature. The teacher, in order to support active learning, must create an environment in which children

- —Explore actively and with all senses.
- —Discover relations through direct experience.
- —Manipulate, transform, and combine materials.
- —Use their large muscles.
- —Take care of their own needs.
- —Choose materials, activities, and purposes.
- —Acquire skill with tools and equipment.

The "key experiences" in active learning summarize the most fundamental processes necessary for intellectual development. The Cognitively Oriented Preschool Curriculum is organized around such groups of key experiences, which support the development of thinking processes in the preoperational child. These key experiences have been derived from Piaget's description of the emerging abilities of the preschooler. Let us summarize these abilities.

After a couple of years of hard work as an infant and toddler, the developmentally normal child has substantially achieved the ability to mentally represent and direct his actions and experiences, and to communicate verbally with others. These are enormous accomplishments; the three-year-old human being is probably a more competent problem solver than any other being on earth except for older members of his own species. The preschooler is becoming able to reflect on his own actions, to recall past experience, to predict consequences in familiar cause-and-effect sequences, to solve everyday kinds of problems in his head without relying exclusively on physical trial and error, and to think about places and times other than the here and now.

Symbolic representation, the utilization of so-called "figurative knowledge" in the form of mental images and imitation, has developed out of the actions of the sensorimotor period (the first year and a half to two years of life). The preschooler is powerfully motivated to exercise these symbolic processes, just as he is obviously "programmed" by inherited patterns to exercise his language-using and language-learning capabilities. He enjoys imitating, pretending, drawing pictures, making "models" of real things out of blocks or clay, because through these activities he is able to exercise his ability to represent the world. He is learning to distinguish symbols or representations from the things they stand for, although sometimes fantasy, magic, dreams, and make-believe are difficult for him to distinguish from reality.

The unconscious "operative" mental structures which guide the young child's thinking processes are, however, not yet organized into systems of mental transformations as they will be in the next period of development, the period of concrete operations. This lack of organization results in an inability to mentally reverse a process or transformation, to separate mentally that which has been combined or to reverse a temporal sequence. While the child can mentally represent a given state, he cannot depict in his mind the sequence of steps which occur in a transformation, whether that transformation represents motion from one point to another or change due to physical processes such as melting and freezing. The child has difficulty focusing on more than one aspect of a relation or process at a time, and he has not yet achieved an understanding of "class inclusion," "transitivity" of relations, or "conservation."

Preoperational thinking is also characterized by "egocentrism" —centering on one's own viewpoint. A young child's conception of space and time is egocentric, i.e., not objective, hence his understanding of causality and measurement cannot be the same as an adult's.

From these facts about the thinking of preschoolers we have derived the following groups of key experiences:

The key experiences in *representation* mobilize the child's emergent symbolic capacities; they help him to encode and store information in a variety of modalities, that is, to use his motoric, visual, verbal, and auditory systems to record and express what he has learned. These key experiences include

- —Recognizing objects by sound, touch, taste, and smell.
- —Imitating actions.
- —Relating pictures, photographs, and models to real places and things.
- —Role playing, pretending.
- —Constructing models out of clay, blocks, etc.
- —Making drawings and paintings.

Language is another mode of representation which is emerging during the preoperational years. Cognitive-developmentalists and most psycholinguists agree that intellectual understandings are mastered *before* the appropriate use of linguistic forms which indicate comprehension of these understandings. Children master, for example, the acts of comparing and ordering *before* the syntactical forms of the comparative and

superlative appear in their speech. Once a child has mastered a concept, it is possible to teach him a verbal label for that concept, but teaching a verbal label does not teach the concept. Language, in other words, is not the primary means by which logical and physical relations are mastered. Action is. However, language and other forms of representation (such as mental images and motor encoding) do seem to be involved in the problem-solving process. Language is also a medium for communication between individuals, making possible the corrective feedback necessary to reduce egocentrism and facilitating social transmission of knowledge. The key experiences in *language development* identified by the High/Scope staff are

- —Conversing about personally meaningful experiences with adults and peers.
- —Describing (and listening to others describe) objects, events, and relations.
- —Expressing feelings in words.
- —Having one's own spoken language written down by an adult and read back.
- —Having fun with language: rhyming, making up stories, listening to poems and stories.

Key experiences which support the emerging *logical structures* of the child include experiences we group under the rubrics "classification," "seriation," and "number concepts." These are the experiences from which the child constructs operational logic:

CLASSIFICATION

- —Investigating and labeling the attributes of things.
- —Noticing and describing how things are the same and how they are different. Sorting and matching.
- —Using and describing something in several different ways.
- —Describing what characteristics something does *not* possess or what class it does not belong to.
- —Holding more than one attribute in mind at a time. (Example: Can you find something that is red and made of wood?)
- —Distinguishing between "some" and "all."

SERIATION

- —Comparing: Which one is bigger (smaller), heavier (lighter), rougher (smoother), louder (softer), harder (softer), longer (shorter), taller (shorter), wider (narrower), sharper, darker, etc.
- —Arranging several things in order along some dimension and describing the relations (the longest one, the shortest one, etc.).

NUMBER CONCEPTS

- —Comparing number and amount: more/less, same amount; more/fewer, same number.
- —Comparing the number of items in two sets by matching them up in one-to-one correspondence. (Example: are there as many crackers as there are children?)
- —Enumerating (counting) objects, as well as counting by rote.

Finally we have the experiences out of which more mature conceptions of physical reality emerge. We group these experiences under "temporal relations" and "spatial relations":

TEMPORAL RELATIONS

- —Planning and completing what one has planned.
- —Describing and representing past events.
- —Anticipating future events verbally and by making appropriate preparations.
- —Starting and stopping an action on signal.
- —Noticing, describing, and representing the order of events.
- —Experiencing and describing different rates of movement.
- —Using conventional time units when talking about past and future events (morning, yesterday, hour, etc.).
- —Comparing time periods (short, long; new, old; young, old; a little while, a long time).
- —Observing that clocks and calendars are used to mark the passage of time.
- —Observing seasonal changes.

SPATIAL RELATIONS

- —Fitting things together and taking them apart.
- —Rearranging a set of objects or one object in space (folding, twisting, stretching, stacking, tying) and

observing the spatial transformations.

—Observing things and places from different spatial viewpoints.

—Experiencing and describing the positions of things in relation to each other (e.g., in the middle, on the side of, on, off, on top of, over, above).

—Experiencing and describing the direction of movement of things and people (to, from, into, out of, toward, away from).

—Experiencing and describing relative distances among things and locations (close, near, far, next to, apart, together).

—Experiencing and representing one's own body: how it is structured, what various body parts can do.

—Learning to locate things in the classroom, school, and neighborhood.

—Interpreting representations of spatial relations in drawings and pictures.

—Distinguishing and describing shapes.

The key experiences are not intended to create fragmented teaching learning situations organized around specific concepts. Rather, they are designed to give teachers an awareness of the basic intellectual processes and contents with which any activity can be enriched and extended. Taken together, they are the teacher's framework for supporting child development. We believe such experiences should be included in some form in any preschool program. They are the intellectual nutrients which sustain the developing operational schemas of the preoperational child, while respecting his limits.

Teachers learning to use the Cognitively Oriented Preschool Curriculum are learning to apply the key experiences to activity planning and evaluation and to observation of individual children. The key experiences provide a way to conceptualize what a developmentally valid preschool program is all about. Because of the power of the equilibration process, it is not necessary to have precise objectives for each child if the range of activities is wide enough and children are permitted considerable opportunity for initiation and selection of activities and materials. Preschool programs can be evaluated according to the richness of experience they provide. The key experiences provide a framework for doing this kind of evaluation.

While the key experiences are the cornerstone of the Cognitively Oriented Preschool Curriculum, we are not ready to say that they completely solve the problem of integrating the "process" and "content" contributions of Piagetian developmental theory. The following questions remain difficult to answer in a conclusive and precise way:

To what extent should teachers attempt to use developmental information about children to create opportunities for activities that provide a "match" for individual children? Under what circumstances is it better to rely on the child to self-select activities which are at an optimal degree of intellectual challenge?

How should a teacher go about striking a balance in the classroom between teacher-initiated and child-initiated activities—a balance among such things as stimulating discovery and problem solving, responding to children's interests, and supporting acquisition of specific concepts, skills, and information?

When is it appropriate for teachers to select materials, plan activities, and intervene in classroom interactions with the deliberate purpose of exercising children's developing operational schemas (comparing, grouping, combining, ordering, and relating objects, classes, events, and locations)?

Under what circumstances can an adult's questions stimulate and support cognitive development?

When, if ever, do verbal labels for classes and relations, given to children by adults, assist intellectual development?

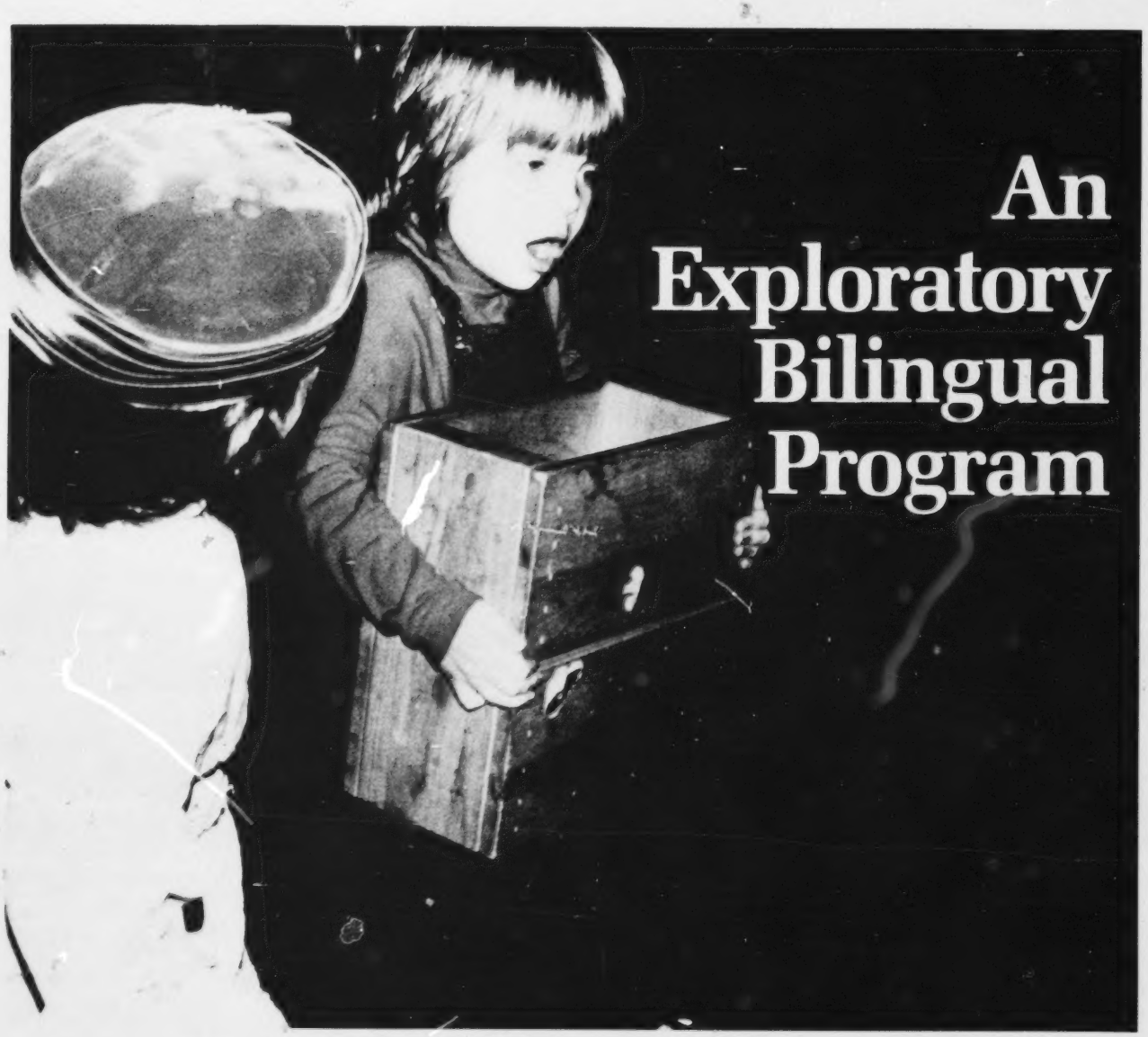
Since language and "figurative" knowledge are rapidly developing in the years before school entry, what kinds of supports should teachers in preschool programs be consciously trying to provide to the development of spoken language and other modes of representation such as mental imagery, imitation, pictorial representation, and the production and decoding of models, maps, charts, and written language?

These questions must continue to be addressed through systematic research. They provide an intellectual challenge to adults who work with young children. Theories of development, like all scientific theories, are useful for the questions they raise as well as the questions they answer.□

Bernard Banet is director of the Preschool Department.

Late in 1975 two High/Scope staff members attempted to test some of their beliefs about bilingual/bicultural education in a practical application at the High/Scope Foundation's laboratory preschool. They recruited a group of 13 young children who would participate in a daily two-hour preschool education program conducted in English and Spanish. The parents of half this group of children were foreign-exchange students from Latin America; the rest of the families were from the Ypsilanti-Ann Arbor, Michigan, area. Four of the children were bilingual, four were monolingual in English, two were monolingual in Spanish, and three were English-speaking but knew some Spanish. The sessions took place between November 4 and December 11, 1975. Much of the classroom interaction was recorded on videotape. In this article, one of the staff members who organized and conducted the program gives his impressions and his evaluation.

DENNIS VIGIL



An Exploratory Bilingual Program

ON THE FIRST DAY of our bilingual sessions at the High/Scope laboratory school, Corey, a five-year-old Anglo boy, was the first to arrive. He didn't know much Spanish, but his parents had told him he was going to attend a bilingual (Spanish and English) class with children three to six years old. Corey set the spirit for the rest of the sessions when he walked into the classroom and said to me with a grin, "Dennis, you're a *viejo*" (old man). And pointing to Chavela, the other teacher, he chuckled, "and she's a *vieja*." He was using these Spanish words as terms of endearment; this was Corey's way of letting us know he was *ready* for the bilingual classes.

Though the bilingual sessions were to be exploratory, we had established three language goals: (1) to support the development of a monolingual child's first language; (2) to introduce, and support the development of, a monolingual child's second language; and (3) to support the development of a bilingual child's first and second languages. With the "open framework" of the Cognitively Oriented Curriculum as our frame of reference, we were able to begin the sessions with some clear ideas about how teachers should behave in a bilingual setting and what elements were necessary to support learning in such a setting. It is our belief that the cultural lifestyle, values and language(s) of each child in any educational setting must be respected, supported and fostered. In our own bilingual classes this meant accepting and using Carlos' "*ciao*,"* Corey's "good-bye" and Gigi's "*adios*."

Because of our commitment to a cognitive-developmental outlook on thinking and learning, we anticipated that the children

Carlos: "It's time for the *ciao* song."
Lisa: "Well I say *adios*."
Carlos: "No, you say *ciao*."
Lisa: "Well I say it another way."
Teacher: "What do you think, Monica?"
Monica: "*Son los dos*."
Carlos: "You can say *adios* and *ciao*."
Jennifer: "I know good-bye."
Lisa: "We can say it all ways . . . *adios*, *ciao* and good-bye."

would learn more effectively in a stimulating environment with a variety of materials and the freedom to use these materials according to their own interests. Implicit in the developmental argument is the belief that teachers need to have some understanding of child-development processes in order to determine what is educationally appropriate for each child. A concomitant of this view is the assumption that language is not "taught" but is, rather, the outgrowth of both the maturational process and the engagement of the child with the environment.

We chose what we called a "bilingual fusion" approach as the most appropriate and effective model for the development of bilingualism for all the children. This meant that both teachers would use Spanish and English throughout the class period as they saw fit, according to their goals and strategies, the given situation and the children's needs. We would not have separate Spanish and English "lessons," nor would we identify one teacher as the English model and the other as the Spanish model.

With our educational outlook thus rooted in cognitive-developmentalism and bilingual fusion, we were able to formulate some specific questions before the sessions started. It was our hope that the sessions would provide some information with which we could *begin* to answer these questions:

- Does the bilingual-fusion approach (more commonly known as the "concurrent" approach) really confuse the children, as has been commonly held?
- How do monolingual children *feel* about the constant presence of another language?
- To what extent can children learn second languages from each other in an "open framework" environment?
- In what ways can the Cognitively Oriented Curriculum be supportive of the bilingual child's continued development of two languages?
- In what ways can the Cognitively Oriented Curriculum be supportive of the child's positive feeling about his or her language(s) and culture?
- What effect does the parents' support of bilingualism have on the child?

Once underway, the bilingual sessions were as exciting as we had expected. One would see on a typical day children making believe in *el rincón de la casa*,

*The Italian word *ciao* is frequently used by Spanish-speaking people in the Americas.

or building a house with large lego blocks in *el rincón de los bloques*, which had *tapetes* and *ventanas*, or quietly working on puzzles or stringing beads in *el rincón tranquilo*. Throughout the classroom there was diverse, active play as some children worked alone and others in groups. It was pleasing to us that the children were not in the least threatened by the fact that both Spanish and English were being spoken at all times. Over in the block area one could distinctly hear Mónica say, as she and Carlos were carrying a "table" into the block house, "*Que se quite Mandy. Esta mesa está grande.*" And in the art area Patty and Sylvia Kristina were making constructions with small, irregular blocks of wood and glue, smiling and enjoying their work; although speaking English for the most part, they would lend an ear to the Spanish spoken around the room, particularly since they both knew some Spanish. (At a later time, during a parent meeting, Patty's mother was to tell us that although Patty was reluctant to speak Spanish before the sessions, she was opening up more to Spanish and was even encouraging her older brother to speak Spanish.) In the quiet area, Corey and Lisa were working with the tinkertoys while chatting with each other. One could hear Lisa ask Corey, "Do you know how to say 'good-bye' in Spanish?" And one could hear Corey's "*adios!*" as he waved his hand. Gigi, who was dressed up pretending to be an old lady, could be seen talking to Chavela. "*¿Dónde está México?*" Gigi was asking. "*Ah, México está muy lejos . . . ¿por qué quieres ir a México?*" "*Porque me abuelita está allí.*"—and so the dialogue went.

Rather than sit the children down on chairs and have them develop first- and second-language vocabulary by repeating words to pictures, we preferred to introduce or reinforce vocabulary in a more natural and casual way by relating it to whatever the children's actions happened to be at a given moment:

> Adrián: "*Quiero guardar el* glue."
>
> Teacher: "*Bien, ¿dónde vas a guardar el* glue?" or "*Bien, ¿dónde vas guardar la goma?*"

There would be no attempt to impose "*la goma*" on Adrián; rather, we would try to open up the choice for him to use the Spanish term as well as the English; I say choice because the intent was not to supplant the child's own language, but to supplement it. Thus, when Gigi, who is bilingual, asked, "Can you *broche* this?" we didn't

attempt to "correct" her. Our response was, "Yes, I'll *broche* that," or, "*Si, te lo abrocho*," or even, "Yes, I'll button it for you." We didn't have fixed responses for anticipated situations. Our responses were more spontaneous and depended upon the circumstances of the moment, the nature of our relationship with the child, the child's level of cognitive development and the extent of his bilingualism, and his attitude toward speaking the two languages.

In regard to second-language acquisition for the monolingual children, we felt it was extremely important for these children to *feel good* about the second language and those in the class who spoke it. With that established, we felt the mechanics of acquiring a second language would come with the dynamics of social interaction in the classroom. By putting equal value on our own use of Spanish and English (both of us are bilingual) we were able to help the monolingual children feel good about the second language. But the key factor in shaping the children's attitude toward the second language was the support of the parents. Corey's parents were a case in point; not only did they support his learning Spanish, they actually used Spanish at home to the extent that they could.

As to direct teaching strategies for second-language acquisition, we generally introduced nouns first, preferably in association with a concrete object: "Mandy, will you please pass me the *galletas*?" or "Yudalith, *cuentame do los cows que están en tu corral de bloques*." But we felt the key to second-language acquisition was not so much the teachers' strategies as the environment itself, which had an "aura" of bilingualism, and which we attempted to make stimulating and supportive in order to enable the children to learn from each other through a variety of practical applications. Probably one of the most exciting discoveries for us was the extent to which the children did actually learn from each other. This was not just a matter of their attempting to teach each other, however; because so much was going on in the classroom in both English and Spanish, it was more a matter of children picking up language through "osmosis." Of interest to us also were the attempts by Spanish-speaking and English-speaking children to communicate through nonverbal means, such as gestures and made-up words that represented the other language.

Another exciting discovery for us was the extent to which bilingual children would willingly act as translators and intermediaries:

Teacher (in house area, playing customer in a restaurant): "*Por favor Jennifer, traigame un café.*"

Jennifer (predominantly English speaker, playing role of waitress): "Okay." (She brings the coffee.)

Teacher: "*Ahora, por favor traigame la crema.*"

Jennifer: "Okay." (She brings the cream.)

Teacher: "*Ahora el azucar por favor.*"

Jennifer hesitates, not understanding *azucar*.

Carlos (bilingual, playing role of chef): "Dennis means the sugar."

In another situation, in the block area, Chavela asks Yudalith, who is monolingual Spanish, if she would share one of the doll figures with Mandy, who is monolingual English. Chavela then strategically decides to ask Patty, who knows some Spanish, to assist:

Chavela: "Patty, will you ask Yudalith if she would share one of those with Mandy?"

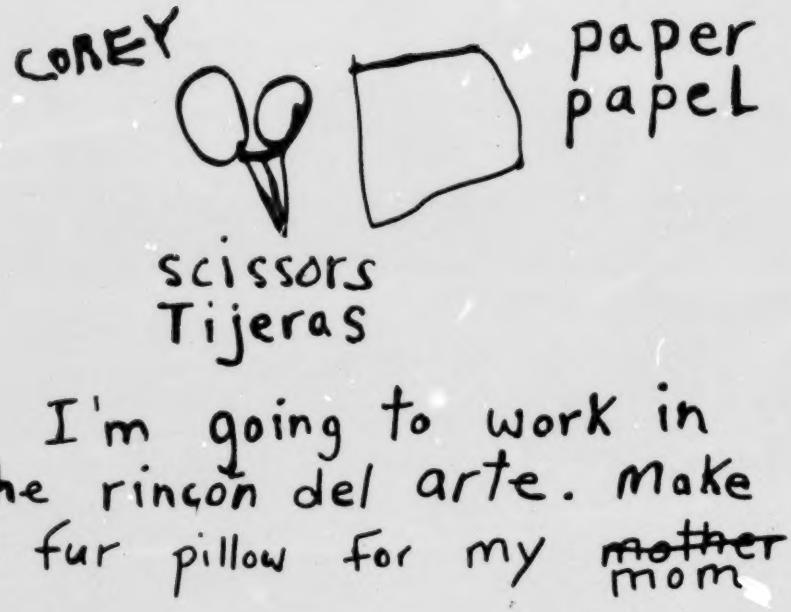
Patty (to Yudalith): "*Mandy quiere uno de esos.*"

Yudalith hands one of the doll figures to Mandy, who accepts it.

Patty (to Mandy): "Now you say *gracias*."

Mandy: "*Gracias*."

Because there has been so much speculation about the mixing and shifting of languages having a retarding effect on children, we kept our minds focused on that issue, particularly with the bilingual children. It appeared to us that the children, and in particular the bilingual children, felt quite comfortable shifting back and forth between English and Spanish. It's our guess that this would generally hold true



in bilingual classrooms as long as the children were actively engaged in an environment that had meaning for them, and as long as they could choose activities that proceeded from their own interests. Because there has been a tendency among bilingual children in general to move away from Spanish (for a myriad of reasons), we were very careful to encourage the bilingual children to feel good about their Spanish and to continue to use it.

Athough these sessions were conducted informally, with no attempt at controlled experimentation, they were nevertheless much more than a mere flirtation with practical issues in bilingual education. They have provided a foothold for any subsequent, protracted bilingual educational programs which would study, in depth, such issues as the following: (1) the value and practicability of developing *two* languages for minority *and nonminority* children (in contrast to the popular language-transition approach or the language-maintenance approach); (2) the consequences of adhering to a bilingual-fusion or "concurrent" model whereby two languages are valued and utilized equally throughout the day (in contrast to the language-separation models); (3) the consequences of adhering to a cognitive-developmental model for bilingual/bicultural education (in contrast to language-oriented or culture-oriented models);[1] (4) the relative importance of supporting the child's use of his dialectical language while gradually introducing the standard language (in contrast to immediate instruction in the standard language, usually at the expense of the dialectical language); (5) the value to bilingual education of a child-initiated process whereby children are encouraged to be actively involved according to their interests and are given choices (in contrast to programs which generally put children in receptive roles only); (6) the value to bilingual education of team teaching in an "open" classroom environment;[2] (7) the value to bilingual education of an environment which encourages children to learn from each other, particularly bilingual children assisting monolingual children with second-language development; and (8) the influence on the classroom process of parents' encouragement of bilingualism in the home.

We need to think seriously about these issues, in the hope of opening up bilingual and bicultural educational opportunities for all the Coreys, Gigis and Yudaliths in this country.□

[1]See the article by Vigil and Moore, "A Perspective for Bilingual/Bicultural Education," in *High/Scope Report 1974-75*.

[2]"Innovative educational approaches which have been developed in recent years such as open classroom and team teaching often have been difficult to implement within the educational system due to resistance on the part of many educators and administrators to new teaching techniques. A bilingual bicultural education program makes it possible to introduce both the innovative educational approaches and the new program at the same time. Commission staff found that both open classroom situations and team teaching approaches are frequently utilized in bilingual bicultural programs. Because of their capability for accommodating groups of various sizes and facilitating change from one grouping arrangement to another with a minimum loss of time, open classrooms are particularly conducive to teaching different groups of students of different language proficiency and dominance. In bilingual bicultural programs, where students of two languages are at different stages of native language development and at different levels of second language proficiency, team teaching may make more effective use of the talents and interests of staff members, permit teachers to give greater attention to the individual student, and provide an effective means of using teachers of both languages to teach different subjects to different students." (*A Better Chance To Learn: Bilingual-Bicultural Education*, United States Commission on Civil Rights Clearinghouse Publication 51, May 1975, page 92)

Dennis Vigil, formerly a field consultant and bilingual education specialist with the Elementary and Preschool Departments, is now on the staff of the Bilingual-Bicultural Unit of the Colorado Department of Education.

DAVID FISK

EARLY CHILDHOOD EDUCATION IN LATIN AMERICA

EN UN AREA DE TERRENO
SE ORGANIZAN LUGARES DE
TRABAJO A MODO DE REFRESENTACIONES, DE AQUELLOS LUGARES
REALES A LOS QUE LOS NINOS PRESTAN MAYOR INTERES; CONEL
OBJETO DE FACILITAR Y REFORZAR DETERMINADOS OBJETIVOS.
(In open land, work areas are organized to represent those real places the children are most interested in, with the purpose of facilitating and reinforcing predetermined objectives.)
Lugar CASA
Lugar SILENCIO
Lugar TIERRA
Lugar TALLER
Lugar ARTE

—A Special Challenge

ERADICATION OF EXTREME POVERTY in the developing world is a challenge much discussed by third-world economists, development planners and professionals working in the social sciences. The evidently unsuccessful attack on extreme poverty through large investments in works of "infrastructure" (e.g., large power projects and construction of higher-education facilities), which was backed by a "trickle down" theory of social and economic progress, has triggered a reconsideration of how development monies should be spent. Many argue that investments in well planned programs directly aimed at helping the poorest to participate in the development process in a meaningful way are not only required from a humanitarian point of view but also pay the highest returns in terms of overall development goals.*

In recent years governments of the poorer nations and international development agencies have begun to take note of these arguments; some are targeting the eradication of extreme poverty as their first developmental priority and are attempting to design programs directly affecting this problem. In line with this overall emphasis, in re-evaluating education and other social-sector investments, increasing attention is being given to two issues of special interest to the Latin American counterpart agencies with whom High/Scope has collaborated. The first is the critical role of parent-infant and preschool programs focusing on health and nutrition as well as the broader aspects of cognitive and social development. The second is the need for changes in the formal educational system so that it may better serve those from the poorest sectors of society. Over the past five years we have had the privilege of participating in a variety of projects in Latin America working toward these goals.

*A thesis carefully argued in DEVELOPMENT RECONSIDERED by Edgar Owens and Robert Shaw and more recently in the bestseller SMALL IS BEAUTIFUL by E. F. Schumacher.

(left)

In Puno, Peru, educators are using the Cognitively Oriented Curriculum as a referent in producing training materials for the early education component of an integral rural development program.

High/Scope's Involvement in Latin America

The Foundation's first intensive contact with early childhood programs in Latin America was through provision of consulting services to a landmark preschool intervention project directed by Dr. Leonardo Sinisterra of the Human Ecological Research Station in Cali, Colombia and supported by the Ford Foundation. This project demonstrated, among other things, that given the proper orientation and support, teachers with minimal schooling could organize, implement and evaluate field trips and classroom experiences based on a developmental conception of child growth.

In 1972 the Foundation began a consulting-services agreement with a pioneering research and development project in Bogotá, Colombia, studying infant-parent interaction. This project, under the direction of Dr. Obdulio Mora of the Instituto Colombiano de Bienestar Familiar, is assessing the impact of a combined program of nutritional supplementation and home teaching and has found High/Scope parenting research a useful referent for the design of the home-education component.

In the fall of 1974 UNICEF sponsored a sequence of short training programs on the Cognitively Oriented Preschool Curriculum for personnel from the Peruvian Ministry of Education working with infants and preschoolers. As a result of these seminars, pilot programs experimenting with key aspects of the curriculum have been started by the Junta de Asistencia Nacional in their child-care centers in Lima *barriados*, and by a regional rural development council in the *altiplano* area of Puno. Follow-up contact is scheduled to begin in 1976.

Dr. Fernando Mönckeberg, head of the National Nutrition Commission in Chile, saw the potential benefits of combining the nutritional services of his agency with the Foundation's infant and preschool educational programs, and it is his interest which has sparked a variety of contacts since 1973 between High/Scope staff and Chilean educators and social development planners.

These contacts have included a series of short seminars in Chile and a workshop for six Chilean educators at the Foundation's headquarters in Ypsilanti sponsored by the Agency for International Development. The training group participating in the Ypsilanti program represented service agencies such as the public-sector Junta Nacional de Jardines Infantiles and the private-sector Fundacion de Jardines Infantiles, Universidad de Chile and the Catholic Universities of Santiago and Valparaiso. The Interamerican Development Bank financed a two-month technical assistance contract which enabled two High/Scope consultants to conduct a training workshop for a group of 40 Chilean early-childhood educators during July and August of 1976. As a result of these efforts, the Cognitively Oriented Curriculum is now used as a major frame of reference in a variety of teacher-training courses in Chilean universities, and some 25 demonstration schools in Santiago are testing and adapting the principles of the curriculum to the realities of Chilean early-childhood education.

"Bridges of Contact"

In these programs and others currently being planned, High/Scope and its Latin American counterparts are attempting to incorporate a developmental perspective on child growth into a variety of programs serving the most disadvantaged populations of Latin America. The "bridges of contact" through which this is being done include specialized technical consultation, overseas training courses (both at our headquarters in Ypsilanti and in the host country) and provision of Spanish-language teacher-training and evaluation materials. These are in place in the following program areas:

—*Design of the educational components* of projects serving young children and their families, including implementation of educational-reform experiments based on key aspects of the Cognitively Oriented Curriculum for preschoolers and primary-school children.

—*Design and implementation of preservice and inservice training systems* to give "outreach" personnel such as teachers, extension agents, community volunteers, etc. a greater understanding of the developmental processes of young children and an orientation to practical ways of supporting these processes.

—*Design of the comprehensive summative and formative evaluation components* for programs reaching young children to identify priority needs, provide operational feedback and give an accurate measure of program effectiveness.

The Role of the Cognitively Oriented Curriculum

While the Foundation's technical support to projects in Latin America has not been limited to what would come under the umbrella of the Cognitively Oriented Curriculum, the curriculum has been of special value in overseas work concerned with supporting child development and teacher and paraprofessional training. As used in conjunction with these efforts, the curriculum provides a convenient framework for a systematic mutual study of how to improve the effectiveness of any educational effort, formal or informal, urban or rural, permanent or temporary, be it well endowed or a barebones operation. The curriculum draws out concepts common to every learning setting, but does not necessarily provide the specific methods or dictate the precise nature of the educational environment. While in one sense it is true that the curriculum is only *one* alternative model, it is not a closed model but a system that encourages one to ask and answer the question, Is this program or activity developmentally valid? The curriculum is able to do this for these reasons:

—It is based on well documented facts about the nature of human development and learning.

—It has a demonstrated effectiveness reflected in 13 years of research and evaluation, including a significant body of cross-cultural data.

—It is explicit enough to be the basis for training and replication; it is a functioning method, not simply an ideology.

—Because of its *process* focus, it is applicable in a wide variety of settings and indeed encourages and demonstrates ways the local *content* of programs can be effectively transmitted.

—It contains quality-control mechanisms and encourages ongoing evaluation of the quality of learning and teaching.

—It is economically viable because it permits and encourages maximum utilization of available natural resources and paraprofessionals. As discussed below, it is usable as a basic model for widespread replication even within extreme resource limitations.

Developmental Validity and Cost Effectiveness

Millions of dollars are invested annually in Latin American early-childhood service efforts in such areas as basic education, nutrition and child care. The nature of these programs is as varied as the populations they serve and the specific problems they are addressing, but the larger ones generally reach their clients through the traditional service models, such as child-care centers, kindergartens and children's health clinics and hospitals. The educational components of these models are generally a reflection of traditional educational requirements and procedures.

These programs are seen by many as an excellent way to promote adequate nutrition, environmental stimulation, hygiene and health care for the children as well as to reach the parents. They are considered by many to be an essential antecedent to any meaningful participation of the poorest children in the formal educational system.

But there are many people who view these programs with skepticism. They point out that the traditional models for child care and education require large numbers of professionally trained staff, massive capital investments and large operational expenditures. Others cite data demonstrating that the payoff from investments in nondevelopmental programs may not be as significant as many would like to believe, and that *new* approaches to the education of young children have to be conceived, approaches that are more than a simple downward extension of traditional educational requirements. They warn that unless the issues of developmental validity, cost effectiveness and replicability are adequately considered, scarce development monies will be squandered, and the solution to the basic problems of early childhood development will only be delayed.

Here are some of the ways High/Scope's counterpart agencies in Latin America have been approaching these problems:

—An experimental project of the Fundación de Jardínes Infantiles in Santiago, Chile has focused on the labor-intensive nature of developmentally valid preschool educational models (as well as the capital investment costs) by training teenage volunteers and young mothers-to-be to serve as monitors in an open-air community park program run under the direction of one professional educator. In this model, now in the experimental stage, the use of community paraprofessionals means that some 200 children are being served by one professional educator in what will hopefully turn out to be an administratively workable and developmentally appropriate educational experience.

—When the question of operating costs came up at a recent meeting of directors of 20 Santiago schools implementing a program based on the Cognitively Oriented Curriculum, the group surprised the High/Scope consultant by unanimously agreeing that it was no more expensive to establish and maintain a cognitively oriented classroom than a traditional classroom. They noted that it was no longer necessary to have a pair of scissors and a textbook for each child and a classroom full of desks. In further examining this point, the educators concluded that every "key experience" identified in the Cognitively Oriented Curriculum could be appropriately handled with readily available and in most cases free materials.

—We found that the "construction areas" of the early childhood centers run in conjunction with a UNICEF-supported integral rural development program in Puno, Peru, consist of clay, water, dung and straw. The children and teachers are using the resulting adobe bricks to set up the divisions in the open-air educational setting! The ultimate value of the learning taking place in these construction areas is, of course, dependent upon *how* these materials are used in the student-teacher interaction. But the choice of materials was certainly more culturally appropriate and just as pedagogically useful as the jigsaw and electric drill you might find in a school in another setting.

It appears that with innovative programming major new investments would not be necessary to make many of the existing social service and education programs more effective. In Latin America, as elsewhere, shortages of equipment and traditional service structures can be compensated for if a new relationship between parents and teachers and children is brought about in a creative service framework.

The Foundation's grassroots approach to educational reform does not permit massive change overnight in the national educational or social service networks, nor at this stage are we even attempting to accurately predict the time frame necessary to effectively work with these networks. However, our experience in Latin America and the U.S. is showing that once this process is started at a critical juncture in any of the various program areas (e.g., preschool or bilingual education, nutrition or health education) it may spread to other areas (e.g., primary education, preservice training, day care). In our Latin American work, the points we have found to be most critical are a careful selection of the counterpart agency and the design of a program model providing systematic support to the grassroots efforts over an extended period of time. We have worked with regulatory and primarily educational institutions (e.g., ministries and universities), and, as shown by our work in Chile, Peru and Colombia, these institutions can be valuable collaborators in certain aspects of our intervention plan. However, joining forces with the *service agencies* directly responsible for implementing programs for needy children is also central to the achievement of our objectives. We are not interested in helping to establish "research" institutions; rather our interest lies in working with the service agencies in their efforts to permanently upgrade the quality of their programs to serve the children from the neediest sectors of Latin American society. We hope that within five to eight years this effort will result in a network of specialized service agencies which could spearhead application of what they have found to be effective to other programs throughout Latin America, and that these programs will in turn make an important contribution to the alleviation of one facet of the problem of extreme poverty in the developing world.□

David Fisk, formerly with the U.S. Agency for International Development in Latin America, directs the Foundation's Latin American efforts.

Parents and Educators:

DOLORES Z. LAMBIE

PARENT-INFANT EDUCATION programs and public policy statements have begun to focus on support for *all* parents — not only for parents of children with physical handicaps or serious disorders, and not only for parents labelled or diagnosed as having parenting handicaps. The evolution from diagnosis of "ills" to the provision of supportive programs for all parents is, of course, not complete. As part of an attempt to document the source and direction of the continuing evolution in High/Scope's parent-infant education projects, I recently compared our objectives for the Ypsilanti-Carnegie Infant Education Project as stated in a 1967 proposal, in a preliminary

Education of both young and adults is ineffective unless it grows out of the initiative of the people themselves, unless it speaks their language, and unless it influences not only isolated individuals but the life of the whole community.

Robert Ulich, ed.
THREE THOUSAND YEARS OF EDUCATIONAL WISDOM *(from his introduction to an excerpt from Pestalozzi's* LEONARD & GERTRUDE*)*

Experts and Equals

report of 1968 and in the main research study of 1968. This comparison is presented in the chart below.

The shift in stated objectives from "altering" a situation that was *supposed* to exist to assisting mothers in "orienting, adopting, obtaining, utilizing, shaping and reshaping" was paralleled in our program by real changes in curriculum. Curriculum is not static—one set of activities, one set of experiences, one environmental arrangement. It is an interactive situation between people. Information, goals, activities, experiences, physical environment, techniques, etc. are all *parts* of a curriculum, but none in itself constitutes the curriculum. The one element that binds them together is people.

People change and are agents of change. Ordinarily the environment is viewed as a set of objects, toys or things, but a curriculum for interactive learning takes into account that there are differences between people, and that being an effective teacher or home visitor or parent educator means recognizing that one type of parenting style will not work for all children. Some parents are very definite about what they are trying to do with their children and how it should be done. Some feel that to some extent as long as the child is cared for, it doesn't really matter what other kinds of interactions adults have with their infant. Some parents have specific goals for their children such as wanting them to be independent at a very early age, and others feel that it is inappropriate to expect anything from infants until they are two or three years old and walking and talking.

An appreciation of pluralism, of alternatives, of diversity, a respect for different life styles —these are necessities in any program that attempts to work with parents, for America is a pluralistic society, and federal legislation now reflects the pressure to protect that pluralism rather than to mandate the "melting pot."

The "real changes" in our curriculum, then, were essentially changes in *attitude* of the staff

Fall 1967 PROPOSAL	Spring 1968 REVISIONS FOLLOWING PILOT STUDY	Fall 1968 OBJECTIVES FOR MAIN RESEARCH STUDY
To alter the mother's teaching style toward that of mothers who teach successfully	To help mothers: orient themselves to the teaching as well as to the disciplinary aspects of the mother-child relationship:	To help mothers: orient themselves to the teaching as well as to the disciplinary aspects of the mother-child relationship:
	adopt a successful teaching style as defined by Hess and Shipman (1967);	adopt a teaching style that reinforces the child's learning and growth;
and to support the intellectual growth of the child directly through training the mother for teaching the child in age-appropriate ways.	obtain and utilize the information necessary to teach their children in age-appropriate ways;	obtain and utilize the information necessary to teach their children in developmentally appropriate ways;
To alter the mother's language style toward more complex and expansive patterns when talking with and responding to her child.	shape or reshape their language style of interaction with their children toward more appropriate patterns;	shape or reshape the language interaction with their children to facilitate the acquisition of speech and support intellectual development.
To alter the mother's management procedures toward use of explanations and reasons in controlling the child.	develop alternative management procedures involving inductive techniques (e.g., explanations) in controlling the child.	

towards the people with whom they were interacting,* changes marked by increased respect for individual differences. We had learned that the attitudes with which curriculum goals are formulated determine whether or not staff will be saying by implication, "You are a bad (or ignorant, or stupid) parent; my goals are better than your goals; the information I have about children is better than the information you have."

This emphasis on respect for individual differences is not meant to deny, of course, that parents do have many goals in common. If you ask parents, "What are your goals, what do you want for your children?" you are likely to hear, "I want my child to be smart . . . to talk better . . . to have the chance I didn't have . . . to do well in school . . . to have a better job so he doesn't have to work as hard as I do . . . to have more time than I have with my children." With some changes in terminology it's evident that these are the same broad goals that most educational programs have: for child development, language production, success in school, success as an adult, etc.

How can educators help parents realize both their common goals and their individual goals? One way, of course, is to share information. But the *manner* in which information is shared is all important: Educators can share *their* expertise with parents, or parents and educators can work *together* to find and utilize information and resources pertinent to the parents' goals.

*The kind of attitudinal change I am speaking of here is rarely reported in the educational and scientific literature, so I am pleased to include the following example, provided by Dr. Michael Resnick of the University of Florida's Division of Continuing Education Family Development Program, from a story in a local Florida newspaper:

> When Aaron (his son) was an infant, Mike conducted a series of responsiveness tests. One of these tests consisted of ringing a bell. "I rang it over here and over there . . . and Aaron wasn't responding . . . Finally, Jacquie (his wife) said, 'What are you doing?' I thought about it. If somebody were ringing bells in my ears, I wouldn't know how to respond either." That was the turning point. Mike decided to throw out the books and start over using himself as the "instrument" for response . . . his own voice . . . his own face . . . and *set out to find where the real needs of parents and children were.* (emphasis added)

Here is a common parenting situation as well as a typical example of sharing information:

Parent: "My child cries or whines all the time. My husband and I are so upset. He wants the baby to learn that it can't be near us all the time. A three-month-old baby needs to learn it can't have attention every time it whines. What can I do?"

Home Visitor: "What are you doing now?"

Parent: "My husband told me that every time the baby whines I am to pick it up and put it in the crib in the other room, close the door and let it cry."

Home Visitor: "Does that work?"

Parent: "No, the baby just cries and cries, until I can't stand it and I go to pick him up."

Home Visitor: "Do you want the child near you?"

Parent: "Yes, I really do, but I don't want him whining all the time."

Home Visitor: "What happens when you have the child near you?"

Parent: "I put the baby in the car seat and he looks around a little bit and then he whines and cries until I pick him up."

Home Visitor: "It's not unusual for babies to cry when they are strapped into very uncomfortable positions or on hard surfaces. Some parents find a baby is happier and more interested in watching things if there is a blanket padding the back of the car seat. Other parents will put a baby that age in an armchair with pillows on each side, or move the crib into the room where they are working. You could try some different ways of having the child in the room with you. Watch to see exactly when the child whines;

that will give you the information you need to decide what to do. I am looking forward to talking with you about it next time . . ."

This is an example of one-way sharing. Although it's a very useful form of dialogue and has the advantage of the educator seeking information from the parent about her child, *all* the information about what to do and how to do it comes from the home visitor, not the parent. Sharing can be *one-way* (I share *my* information with you) or it can be *two-way* (we share with each other what we both know best—we're *both* experts). In the latter case, information is more likely to be learned and used, the more so if shared in the context of actual experience. In the example above, the home visitor may have given the mother some valuable information, but it is more likely that changes in the mother's attitudes and behavior with her child would have been assured if the home visitor had joined in the experience:

Parent: "I put the baby in the car seat . . ."

Home Visitor: "If you're willing, let's do that now. Let's put the baby in the car seat and see what's making him so unhappy."

Parent and home visitor put the baby in the car seat near them and try to play a game with toys. The baby cries as usual.

Home Visitor: "It's not unusual for babies to cry when they're strapped into uncomfortable positions or on hard surfaces. What could we do to make the baby more comfortable?"

Parent: "Let's put the crib blanket under the baby and see if he stops crying."

In this way the home visitor would have been helping the parent solve a problem for herself by actually doing things with the parent and baby; the parent would have had the chance to determine, empirically, what works best with her child

and what is most satisfying to them both.

When it's not possible to enter into experiences, home visitors can still involve parents in a *two-way* sharing of information. Not too long ago a supervisor went on a visit with a home visitor, and the mother began the visit in an argumentative tone (evidently she had had this conversation with someone before): "Boys are smarter than girls and that's why this child (a girl) is just acting so dumb, because boys are smarter than girls." The home visitor tried to convince the parent that all boys are not smarter than all girls and that maybe if they could provide a situation that was interesting enough for the little girl she would learn too. The mother remained unconvinced. The supervisor said, "Mrs. _____, in your family are all the boys smarter than all the girls?" They smiled at each other, sat down and had a talk about which of the children in her family, male or female, did things sooner. Did they walk sooner, did they talk sooner? Was that really what learning was about? Did that make you smart?

This dialogue succeeded in changing the mother's opinion because she was an expert on her own family; *her own observations*, brought out by the supervisor, served to disprove her ill-considered but firmly held belief. How different is such a dialogue from the authoritarian, "Now I shall teach you in such a way that you know that boys are not smarter than girls."

Generally speaking, people respond better to *cooperative* learning situations where each person is an active and equal participant. Home visitors can help parents feel that their views are important, that they can learn to observe their children and rely on their own informed judgement in raising them—that they possess intuitive knowledge and a capacity to learn by doing that is more valuable than all the child-development information contained in books or in the minds of home visitors. Programs that depend solely on experts or research data to determine the content will fail just as surely as programs that depend solely on parents.

Current newspaper articles, books and advertising brochures assail us with information on how to be an effective parent. Despite this barrage of materials, many people still question the effectiveness of their parenting skill, while some don't have the time or resources to utilize the "expert" information. Programs working with parents are discovering the limitations of written materials in communicating information and affecting parents' attitudes toward child-rearing. As Lally and Honig point out,

> The problems that we face today are not solved simply by the provision of curriculum manuals or by dissemination of exemplary cognitive programs for infants and young children . . . Hopefully they can be solved by . . . a climate in which the parents and caregivers can feel better about themselves and can see themselves in positions of responsibility and pride with regard to the education of their young children." ("Education of Infants and Toddlers," in THE EXCEPTIONAL INFANT, Vol. 3)

A parent in High/Scope's Home Visitor project expressed this "responsibility and pride" when she said, "High/Scope has made me aware of what my child is doing at his particular age. It has encouraged me to spend more time with my children as individuals. High/Scope has taught me to encourage my child to do things I thought she could do, without pushing. High/Scope has also helped me enjoy my children more."□

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DRAMA in the Classroom

—a generative approach

RICHARD LALLI

I CHILDREN DERIVE particular enjoyment from dramatic activities they have generated themselves. They are always ready to re-create some part of their home life, some person they have known or seen or read about, some situation that has personal meaning for them. Through such re-enactment they build on these experiences and thereby deepen their understanding of them; they become aware of what people different from themselves do, say and feel once they've tried becoming those people. As children grow they generate more sophisticated forms for their dramatic instincts. They rarely run out of ideas or become tired of generating their own dramatic play. They stimulate one another to expand the content, detail and devices of their invented plays. While doing drama they find many ways of solving the problems they discover. They use language, costumes, music, dancing, puppets, food and the audience in their creative efforts.

A generative approach to drama does not aim to produce polished actors and actresses. Rather it seeks to help children develop their capacity for cooperative dramatic play, in order to (1) provide occasions for thinking through and solving problems and (2) allow children to build upon their communicative and expressive potential.

Two recent productions at the High/Scope Elementary and Middle School illustrate some aspects of child-generated drama. In one play, "The House on the Hill," six children created a seven-scene collage of events. In the other, "History of Black America," one twelve-year-old wrote a detailed script and directed a production with many children of different ages.

"The House on the Hill"

This play grew from some children's plans to have a party. They gathered one day to make a list of foods each person would bring. They invited an adult to help and along the way decided the party would be part of a play. Lisa, age seven, started writing: "One's up on a time." Before getting much further everyone had agreed to first make a list of the characters' names. By this time five people were involved:

Lisa (age 7)	*Brenda*, a mother
Nikki (age 6)	*Christy*, her teenage daughter
Johnnie (age 9)	*Suzie*, their maid

Sonji (age 10) . . . . . *Shalisa*, a college girl

Mr. Lalli (teacher) . . . *Grandfather*

In the course of making up the story, these people were added:

Tania (visitor) . . . *Grandmother*

Tim (age 7) . . . . . *Bill*, the milkman, paperboy and mailman

Robert (age 11) . . . *Bob Wayne*, the repairman

These parts were not chosen with explicit relationships in mind; only later did everyone agree that the grandparents were married, and that they were the parents of Brenda, the mother. Varying conceptualizations of what the play would "be like" were verbalized and negotiated as the children wrote the scene descriptions. But first they needed to settle upon the stage setup. There would have to be about five houses. The home where the party was to be held got center stage; the maid's home would not be visible to the audience.

The children started writing: "One day . . ." The adult helped them focus: "Which day? What time?" Making such simple yet exacting decisions gave them a more permanent framework within which to develop the story. They devised this scene format:

SCENE I: One Monday Morning

Shalisa—just about to go to school

Brenda—calling the maid to come down and clean

Suzie—talking on the phone

Christy—getting ready to go to school

Grandparents—sleeping

Bill—delivering milk

Bob—offstage (working the lights)

Three scenes were composed in this fashion in half an hour. The action of the play was to culminate in a party.

At various times during the next few days the children gathered to complete the scenario, read it over many times, write about their characters and draw pictures of how their houses would look. They were not concerned with rehearsing, even when the performance was a day away, but instead spent time preparing the set and expanding the story. There were some new elements: Sonji was to have a boyfriend, which would lead to a wedding; so the party at the end would be a wedding party. Tim would be Nikki's boyfriend because they're the same height.

The younger children were involved only in their own parts. The two older children, Robert and Sonji, however, continually made decisions which coordinated many parts and produced a somewhat logical sequence of events. In so doing they tended to become the main characters.

Individual interpretations of what the play was really about grew as the group began setting up their houses and playing their roles. So many elements were at work — eight characters and seven scenes — that most of the children could not grasp the overall logic of the play. But they were not really concerned whether the audience would understand the story. Only Sonji wanted to hurry and start practicing so that she wouldn't forget her part; the younger children were not looking that far ahead.

The highlight of the play for most of the children was the final party, which concluded with refreshments for the audience. During the performance Robert read the scene descriptions into a microphone and amplifier he had rigged up. He also worked the lights and sound system. Some of the players merely pantomimed actions and let the grandparents (the two adults) take over. Everyone was "on stage" most of the time, although they were relatively unaware of what co-players were doing. The final production was a fifteen-minute series of many simultaneous events.

"History of Black America"

For a few months Carmen, a twelve-year-old middle schooler, had been reading the EBONY PICTORIAL HISTORY OF BLACK AMERICA, and she decided to write a play about how black people have been treated in America. Carmen knew how she wanted to go about this production. She read parts of the book, picked events and translated the descriptions of the events into her own words. She had previously collaborated with other children in the class on two other scripts, but she wanted to write this one on her own, because, as she said, "other children aren't able to compromise." The script, which she typed twice and dittoed herself, has seven scenes with precise lines and some stage directions. Here are some of the scenes:

SCENE 3

Harriett: Come on my people, let us hurry. Let us not be slow. We want to be fast as we can. We will have to do a lot of walking and not all of it will be in the underground tunnel. We will have to dress up as strangers so that no white man can know that we are runaway slaves.

Greg: Harriett, let me tell you something. You

sure do got a head on your shoulders.

Harriett: Well, thank you Greg.

Soon in the next part of town . . .

SCENE 4

Greg: Wow, man, what a beautiful place you picked out, sweet mama. You really did it this time!

Harriett: Never mind about all that sweet mama stuff right now, Greg. We have to find houses and get settled.

(They start singing the song)

SCENE 5

Narrator: Well, everything went fine for Harriett and her people. She transported all of them to this beautiful part of town and they enjoyed this and they built their houses and settled down and had lots of children and lived very happy. Harriett knew she was doing wrong escaping like this but she never gave up faith. That was the most important thing to her and her people.

While writing the script Carmen seemed to have a very clear mental picture of what she wanted the play to be like. She could make decisions very quickly regarding the appropriateness of lines, the use of music, the continual addition of new, interesting details. She has the narrator summarize the action between scenes; at the end the narrator describes a number of black Americans who have played significant roles historically.

At the time this article is being written, Carmen is just completing the script. She feels she will need another month to do the following:

1. Get everyone together for a read-through.
2. Get props.
3. Get the right scenery and stage.
4. Get people to learn their lines (in two weeks).
5. Practice each scene.
6. Dress rehearsal.
7. Sell tickets.
8. Put on the play.

She realizes, though, that she can't set a performance date since she's not sure how long it will take people to learn their lines and how difficult it will be to get everyone together at the same time to rehearse. She has not yet thought about some aspects of the production process, such as lighting and space for the audience, but she is confident and patient. She has already spent one month preparing the script.

II

In developing drama as a content area for the Cognitively Oriented Curriculum, we have been identifying dramatic behaviors of children which reflect cognitive-developmental stages as described by Jean Piaget.* By allowing children to demonstrate these behaviors through their self-generated dramatic activities, we are learning what teachers can observe and strengthen as they facilitate drama in the classroom.

The two plays described above illustrate some characteristics of natural dramatic behavior that reflect general thinking abilities.

*Children in the preoperational, concrete operational and formal operational stages of development are referred to here as, respectively, younger, older and adolescent children.

(In situations where children have been "taught" drama, such characteristics may not be evident, for these children may stop relying on their generative abilities and merely follow rules or mimic the teacher's example.) The most obvious differences in children's dramatic behavior can be seen in the roles they play. Children choose roles that are within their range of social awareness. The youngest children in our first example chose to depict characters they had direct knowledge of, as young children usually do — mother, daughter, paperboy. They envisioned these characters in terms of their general contours, with few precise details to give them individuality — in other words, they portrayed them as "types" rather than individuals. The older children included characters they had seen once or a few times, perhaps only from a distance (or on a television show) — maid, repairman, college girl. Older children seem to prefer roles that pertain to their own aspirations — what they want to "be." Adolescents like Carmen can portray people about whom they have only heard or read, who embody some ideal or virtue with which the adolescent identifies.

Thus the spectrum of roles children choose ranges from the immediate for the youngest, to the more distant or infrequently seen though still visible for the older children, to the "invisible" (historical in our second example) for the oldest. In addition, children at all ages are attracted to various exciting characters, such as those who possess some power or magic.

Children's dramatic actions and re-creation of events demonstrate their ability to coordinate details. Young children repeat a few familiar everyday actions which are usually rather simple, such as reading a newspaper or watching TV; they do not express the kind of person a character is, but merely what he or she often does. Older children become concerned with the details of realistic depiction. They make a room look just right or walk with a wiggle and an armful of books the way they think a college girl does. They select complex actions such as hostessing a party or getting someone to help them fix a car. Adolescents coordinate even more details and variables. They are concerned with details of gesture, facial expression and tone of voice, which they try to control as they act. Drama depends upon complex relationships among players' actions, and it gains in meaning as adolescents intentionally link events and characters.

As children develop intellectually, their dramatic behavior encompasses more details and more interactions with co-players. Young children are often unaware of co-players and therefore do not relate to them. Older children set up situations which depend upon interactions among the group: in order for the party to occur, someone must invite the guests, prepare the food and clean the house, after which the guests must all arrive and do what they think happens at parties. This requires much response to others.

Young children choose characters and act out events spontaneously. They are natural improvisors. After setting up some props and trying out some roles they can often say what role they want to play and mention a few things the character would do, but these plans are often forgotten as improvisation takes over. Older children can plan roles and specific events cooperatively. They anticipate problems and figure out what each person will have to do in order for the events to occur. Adolescents will often write the entire script, complete with

stage directions, before acting anything out. They plan events with the effect on the audience in mind.

III

Teachers can facilitate child-generated drama by encouraging children to generate the content and by helping them to plan and record their plays in a manner appropriate to their level of development. Teachers can then observe two aspects of cognitive experience which drama elicits and strengthens — time and awareness of other points of view.

In few other activities do children have the chance to scrutinize and re-create time as in drama. Children at different stages of development perceive time in distinctly different ways and thus represent time differently in their dramatic play. Nikki, a six-year-old, was content to go to bed at noon in "The House on the Hill." She spent her time doing only three things: going to school, going to bed and talking on the phone. On the other hand, the two older children, Sonji and Robert, wanted things to happen logically, to the point where basic (though dramatically irrelevant) steps could not be omitted; for example, Sonji insisted that a complete new scene be inserted since she had to walk *to* school before she could walk *from* school. Consequently, as older children try to include as many parts as possible to represent time comprehensively and logically, their plays become long continuous scenes with few highlights. They may then divide the action into separate scenes, but usually nothing has happened *between* scenes. A still older child, Carmen, showed more awareness of what was dramatically appropriate as she condensed over one hundred years of history into eight scenes in her "History of Black America." In these scenes she tried to present only key events in a logical sequence; the scenes varied in length according to the effect she wanted to achieve.

Children's awareness of other points of view expands as they develop. Young children portray very simple actions of very familiar people. They do not firmly distinguish between themselves and their roles, or among the roles they play, and they frequently have only a vague notion of co-players' roles. As they grow they are better able to respond to co-players and to cooperate, and the invention of drama becomes a truly social affair. This new dimension brings intrigue, conflict and excitement to the activity — the roots of drama. Older children want to make things happen. This takes organization and awareness of others' roles, as well as the ability to distinguish clearly between oneself and one's role.

Many situations arise in dramatic activity which require children to consider how someone other than themselves would feel, think and act. With adolescents another dimension is added to this awareness of other points of view: they think about what the audience will think and see. Frequently they stop to objectively view what they are doing — to picture it in their minds from the audience's position. This complex process of stepping into someone else's shoes gives rise to questions like, What does the audience need to know? How will the audience feel? Is this as clear to the audience as it is to me? These are questions that professional dramatists must ask themselves, and it is exciting to see adolescents discover their significance.

The fact that differences in dramatic behavior are linked to cognitive development suggests that adult expectations should

be geared accordingly, and that adult interventions should respect the natural propensity for dramatic activity that most children will display if they are given adequate space and time and encouragement. Teachers can help children organize their own plays, write them and produce them. The dramatic play we see on playgrounds, in the backyard and in the classroom can lead to educationally significant experiences, guided but not controlled by teachers, in which communication, cooperation, problem-solving, movement and thinking skills are strengthened as children express their conceptions of reality. □

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Operativity and the Cognitive Unconscious

A Piagetian Perspective on Thinking and Learning

ROBERT D. MATZ

IMAGINE A FIVE-YEAR-OLD girl playing at a water table. She discovers that a wooden spoon and a cork both may float on the surface of the water. If the child's thinking about this event were cast into adult language, it might take the following form: "The cork and spoon are both made of wood and they both float . . . wooden objects float, chairs are wooden, chairs float, metal chairs . . . will float likewise."[1] From the perspective of adult logic there are certain flaws in the child's reasoning. One mistake is the confusion of the class of wooden chairs with the class of chairs in general (including metal chairs, plastic chairs and all other types).

What factors have led the child to make this mistake and what significance does this mistake have? Many people would say that the child has acquired an incorrect fact about chairs, and that it is important to insure the child's early acquisition of a correct base of knowledge about the world in order for the child eventually to attain adult concepts. Let us refer to this point of view as one centered upon the content of thought, or its *figurative* aspect. For the purposes of this article, figurative processes may be defined as those elements that can be a part of one's moment-to-moment awareness. For instance, tactile perception, mental imagery, and memory of mental symbols are all elements of figurative thought. Thus, the types of things we refer to as facts, rules, and concepts all possess a figurative character when they are in our awareness.

Operative thought

Cognitive-developmental theory, informed by the work of Jean Piaget and his colleagues, recognizes the importance of figurative processes while affirming the existence of a complementary set of processes referred to as *operative* thought.[2] Operative processes, which are unconscious, lend significance to figurative processes because they permit mental transformations from one figurative element to another.

For example, one type of transformation is the action of combining; its inverse, separating, is another. After arriving at a particular stage of development, people can mentally combine four chairs with two chairs and conclude that there are six chairs. The figurative elements in this process are three different quantities of chairs. Readers may have various ways of representing these quantities to themselves (for example, as images of groups of chairs, or as the verbal rule "4 + 2 = 6"), but there will always be three quantities.

These three quantities are in no way provided by direct experience —one cannot in reality start with six chairs in a room and put four of them in one corner, two of them in a second corner, and six of them in a third corner so that there are three different quantities at the same time. The three quantities are mental products created by the operations of combining and separating. These operations allow us to understand the connection between one moment of awareness in which there are two separate groups of chairs and another moment of awareness in which there is a third group. Thus, another way of representing the relationship between figurative and operative processes is to say that operative processes allow us to extract meanings from the changes of one moment of awareness to another.

The operations of combining and separating are also relevant to the first example of the child's reasoning at the water table. A cognitive-developmentalist would assume that the child had not developed the operative structure of class inclusion, the ability to combine and separate a class of objects or events with superordinate classes and subclasses. In the example, the child confused the class of wooden chairs with the class of chairs in general either because she had not acquired the mental operations of combining and separating or because she was

not geared to use the operations in her reasoning.

For the cognitive-developmentalist, the significance of the child's mistake would not be that she should be taught directly some facts about chairs. Instead, the cognitive-developmentalist would notice that the child was engaged mentally in attempting to manipulate classes of objects and events and would attempt to extend this activity at appropriate moments. Once the child consolidated her structure of class inclusion, the "facts" about chairs would be obvious to her.

The cognitive unconscious

Cognitive-developmental theory involves both operative and figurative mental processes; other theories tend to involve only figurative processes. The reason for this omission is not incidental. Figurative processes are easiest of the two for most persons to understand, because we are, for the most part, unaware or unconscious of the operative aspects of thought. Since each person's operative processes are predominantly unconscious, it is difficult for us to appreciate the role they play in our thinking, and it is that much more difficult for us to apprehend the workings of operative structures in the thinking of children.

The term "unconscious" most often refers to memories and drives that are removed from awareness because they are threatening to the self. However, cognitive psychologists recognize the existence of other mental processes that are characteristically outside of awareness not because of emotional conflict but because of some design features of the human brain. One writer has suggested that the pervasiveness of these design features prohibits us from recognizing the existence of the cognitive unconscious in much the same sense that a fish would probably be the last creature to discover water.

One of the design features of the brain is the speed with which one unit of thought follows another. Experiments in human information processing have shown that sequences of thought run off in bursts of microseconds. Yet our awareness of our thinking does not seem to proceed nearly as quickly. So we are generally aware of the *products* of our thinking rather than the *processes*.

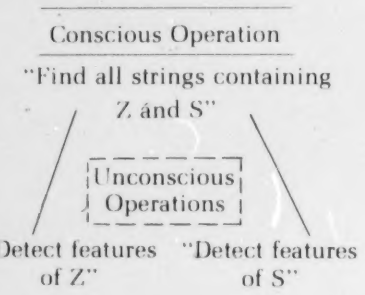
Another design feature is the multiplicity of thought. Research has demonstrated that mental operations often run together in parallel fashion, with several related units activated in a simultaneous pattern. One area of this research has been the visual scanning of printed lists. Subjects scan a list of consonant strings until they find one that has some critical property such as the letter Z. The result of importance is that it takes no longer to identify a string if a practiced subject is looking for several letters at once than if the subject is searching for one letter only.[3] For example, suppose the following strings are a section from a larger list:

CTVGT	WRDZQ	LSYJD
SDZLB	DPKBL	KTVGL
NYXCH	HTGCX	RBCMB

It will take the subject no longer to find all the strings with two letters, Z and S, than it will to find all the strings with one letter, Z. Other research has examined more complicated problems and has shown how they require several ideas to be activated simultaneously to achieve solution.

This demonstration of the capacity to conceptualize more than one factor simultaneously seems to belie our intuitive knowledge of the difficulty of engaging in two types of tasks at the same time. In fact, there is considerable evidence that people cannot follow two conversations at once, or solve two puzzles at once, without a decrease in succesful performance. This apparent contradiction may be resolved by qualifying the assertion of the multiplicity of thought: mental operations may occur simultaneously when at least one of them is "automatic" enough to be outside of consciousness.

The activity of letter identification can be represented in the following manner:



The representation indicates that the actual processes by which the individual letters are recognized usually are unconscious and can occur simultaneously. The unconscious operations referred to in the diagram can be thought of as "rules." The rule for recognizing the letter Z can be represented in verbal form as follows: "If a letter has two horizontal parallel lines connected by a diagonal from lower left to upper right, then the letter is a Z."

Beyond introspection

These features of the cognitive unconscious point to the fallibility of introspection for gaining knowledge about the activity of thinking. There is a strong tendency to believe that the elements observable through introspection are all there is to our thought. The tendency is so powerful that one scholar has referred to it as the major stumbling block in the path of the psychology of intelligence.

Once one has been alerted to the inconclusiveness of introspection, one can easily find commonplace illustrations of how individuals do not have access to their own cognitive processes. For any particular domain of thinking skills, this lack of access can apply even to individuals who are highly

proficient. For example, a few years ago I was attempting to teach myself to recognize trees by name. I had a friend who was able to identify correctly most varieties of trees, and I would often ask her to inform me of how she knew that a particular tree was a walnut, spruce, or elm. Her responses, given in seriousness, were similar to the following: "I just know it is a walnut tree because walnut trees remind me of my father."

While it was true that walnut trees reminded her of her father, this memory needed to be the result of a set of other cognitive processes. Detection of the particular features of walnut trees related to properties of the bark, leaves, and composition must have taken place before the memory of her father. Otherwise there is no reason to suppose walnut trees would revive the memory any more than other varieties of trees.

In order to reach beyond introspection, then, it is necessary to step outside of thought and examine it from a different perspective. A perspective informing cognitive-developmental theory is that of modern biology. A line of reasoning derived from the principles of modern biology suggests a third design feature of mental functioning—that operative processes control figurative processes.

One can begin to appreciate this statement by asking the biological question of how under even the best of all possible conditions humans are capable of adapting to the demands of a changing environment. Adaptation in this sense refers to the ability to use past experience to respond successfully to a present problem. Very often adaptation is demanded in situations possessing an element of novelty. These situations do not need to be very dramatic; individuals may encounter them daily.

As an example, imagine a situation where a man needs to reach the ceiling of a room about four feet over his head. Suppose there is no ladder available but there is a chair in the room. Suppose further the man had never perceived anyone standing on a chair and had never encountered any verbal statement about standing on chairs. Despite these constraints, one can assume most people would be capable of reasoning through the problem and eventually using the chair to reach the ceiling. But this ability to "reason through" must be attributed in the main to operative, not figurative, thought. If the man had neither seen nor heard about the possibility of standing on a chair to reach a ceiling, his figurative thought processes could not in themselves have provided the solution. This is clear when we consider the properties of figurative thought. One of its major components is visual imagery, which can be likened to a collection of mental snapshots. Visual imagery in itself cannot have a problem-solving ability (although it can be used to solve problems); we cannot assume that a set of snapshots would be capable of "imagining" a snapshot not already in the set.

The same argument may be extended to the figurative process of memory for verbal symbols. In itself this process would consist of something like a collection of definitions. The definition of "chair" would be a collection of all the verbal statements one had either heard, read, or been aware of thinking about that were explicitly related to "chair." Again, verbal statements do not in themselves have a problem-solving ability. A set of verbal statements would not be capable of "imagining" a statement not already in the set.

Operative schemes

In attempting to make sense of his observations of the developing ca-

pacity of children to adapt to novelty in their environment, Piaget hypothesized the subordination of figurative to operative processes. It is the operative processes that provide the logical, problem-solving components of thought. Piaget refers to these hypothetical processes as schemes, or plans of action. His treatment of the construction of the scheme forms an underpinning for cognitive-developmental theory.

Schemes are akin to plans of action because each scheme functions like a compound rule with an *if* clause and a *then* clause. For instance, the rule for recognizing the letter Z was expressed earlier in this form: "If a letter has two horizontal parallel lines connected by a diagonal from lower left to upper right, then the letter is a Z."

An individual's current repertoire of schemes could be likened to rows of lightbulbs on a switchboard.[4] Each lightbulb has sets of incoming and outgoing wires. The outgoing wires lead either to other schemes or to directions for physical action. The incoming wires each correspond to a feature in the environment capable of activating the scheme. The environment of a scheme is composed of both figurative processes and of other schemes. In this analogy, the incoming wires correspond to the *if* clause of a compond rule, and the outgoing wires correspond to the *then* clause.

For instance, consider how the scheme for "chair" may function during the microseconds between an individual's perception of a particular chair and the application of his knowledge about the chair. Two of the many figurative elements of a chair are "has legs" and "has a horizontal seat." Because all of the individual's schemes are extremely active and want to apply to any possible input, the element "has legs" can activate many schemes, including the schemes for "people," "animals," "dresser," etc. The element "has a horizontal seat" can activate other schemes. However, the only scheme capable of including both of these elements is the "chair" scheme, so it will be the one to apply to the figurative input. In our analogy, when a particular scheme applies to an input, its bulb is brightened.

Depending upon the individual's experience and developmental level, the application of the chair scheme is itself a feature capable of activating other schemes, which want to apply to features of their environment. Some of these schemes may be of a more general level of applicability than the "chair" scheme itself—"inanimate," "capable of supporting weight," etc. In the earlier example of the problem of reaching the ceiling, the activation of the scheme "capable of supporting weight" is a component of the solution.

The capacity of activated schemes to activate other schemes is one of the distinctive features of Piaget's theory of cognition. Another is the capacity of schemes to learn from their own experience. This capacity helps to explain the working of logical operations such as class inclusion. The experience of a scheme refers to its history of being activated either simultaneously with other schemes or in an invariant sequential order with other schemes. Schemes learn from their experience by generating new patterns of coactivation among themselves. This process is referred to by Piaget as *reflective abstraction*.

In order to think through this complicated concept, reconsider the "chair" scheme and the example of the young child's reasoning about the sinking and floating of chairs. The child was unable to think about one level of specificity of chairs, "wooden chairs," without losing track of the level of "chairs in general." Explaining the child's reasoning in terms of the switchboard analogy, neither the scheme of "wooden chairs" nor the scheme of "chairs in general" are serving as features of activation for the other. When the "wooden chairs" bulb brightens, the "chairs in general" bulb does not necessarily brighten, and vice versa.

During the course of the child's continued experience of reasoning

about superordinate and subordinate classes in a variety of situations, schemes corresponding to both types of classes will be activated in sequence through the pull of experience. For example, suppose a child is riding on the freeway with her family. She amuses herself by gazing at the cars on the road. First her attention focuses on the different colors of the cars, mentally separating the class of cars in general into subclasses according to color. Then, she notices that all of the cars have tires, mentally recombining the subclasses into the general class. At some point in time, through numerous experiences such as this one, the mental actions of combining and separating will have occurred together often enough to become a structure, through reflective abstraction. Then the scheme for any general class will be activated whenever its subclass is activated, and vice versa. (Class inclusion itself is a member of a larger group of operative structures, all of which develop through reflective abstraction.)

Thought and language

In many respects, Piaget's theory is only a place-holding theory. It points the direction for further exploration, but remains in need of considerable refinement. Even so, the theory has already led to numerous experimental results that would not have been predicted by competing theories of intellectual development. These results reinforce the importance of distinguishing between figurative and operative processes.

One set of results has been in the area of the relationship between thought and language. In this area, Piaget's major contribution has been to reveal the productivity of the thought of the infant before he has acquired language. In the infant's progressively more elaborated capacity to respond adaptively to novelty in the environment, Piaget has described a practical intelligence already capable of transforming perceptual content. His descriptions turn upon the concept of the scheme:

> For example, a scheme can consist of subschemes or subsystems. If I move a stick to move an object, there is within that scheme one subscheme of the relationship between the hand and the stick, a second subscheme of the relationship between the stick and the object, a third subscheme of the relationship between the object and its position in space, etc. This is the beginning of the relationship of inclusion. The subschemes are included within the total scheme, just as in the logical mathematical structure of classification subclasses are included within the total class. At the later stage this relationship of class inclusion gives rise to concepts. At the sensory-motor stage a scheme is a sort of practical concept.[5]

Before the recent impact of Piagetian theory, it was customary for psychologists to accept the child's acquisition of language as an explanation for subsequent progress in thought. In other words, it was assumed that children could not make much sense of their environment until they learned vocabulary and syntax. The predominant position now is that the development of operative thought is itself the pacesetter of language development. For each landmark in the universal sequence of language development, there is evidence that cognitive development is the influential factor.

For example, consider the use of the one-word utterance, or holophrase. The most important research finding about the holophrase is that children use the one-word utterance to stand for meanings that adults would represent with an entire sentence. Evidence of this has been gathered by observing children's use of the same holophrase, such as "ball," in different situations. The idea behind this research is that in order to understand what the young child is saying, it is necessary to observe what the child is doing. In different situations, the child may use the utterance "ball" to mean "That is a ball," "I am throwing the ball," "Give me the ball," or spoken while crying, "Help! I dropped the ball and can't reach it."[6]

Since one may assume that the child understands these meanings before he or she is capable of expressing them with formal language, the child must have acquired the necessary schemes in advance of the language content. The types of schemes necessary for the child to produce these meanings are precisely the ones Piaget has documented so carefully. For instance, it is the development of the concepts of object permanence and causality that allow the child to perceive himself alternately as the agent of an action in "I am throwing the ball" and as the recipient of an action in "Give me the ball."

The symbolic function

Among persons who base their philosophies of knowledge upon the figurative aspects of thought, there is an inclination to view verbal language as the cornerstone of knowledge. The line of reasoning often takes this form: Verbal expressions can stand as brief symbols for complex objects, events, and relationships. In contrast, other symbolic modes, such as imitation or gesture, do not possess this ability to condense and express knowledge. Therefore, the verbal mode is the only one with value in terms of the acquisition of knowledge. A consequence of this reasoning is the discounting of forms of communication besides language, and this has sometimes led to the teaching of language in a mechanical fashion, as though it were an ingredient that is best divorced from a child's ongoing experience. Some educational programs for profoundly deaf chil-

dren, for example, attempt to teach a certain number of written words to the children each year. These programs do not attempt to capitalize upon the natural interests and activities of the children, perhaps because the educators cannot perceive any value in the activities of children without oral language. The curriculum process centers upon drill and rote rehearsal. Sometimes the use of gestural language among the children is punished. As an outcome of this type of program, young deaf children can sometimes demonstrate comprehension of one hundred written words without having any understanding of the communicative uses to which the words might be put.

From the cognitive-developmental perspective, these attempts to teach language (and by extension, to implant knowledge) in isolation from ongoing experience are misguided because they assume that symbols exist in words rather than in the mental activity of people. According to Piaget, symbol formation occurs when schemes are activated by the memory of experience instead of by experience itself. The symbolic function can occur in many forms—imitation in the absence of the model (deferred imitation), symbolic play, gesture, drawing, mental imagery, and verbal language. Since each of these forms permits the representation of objects and events not perceived in a particular moment, they each contribute to the economy and flexibility of thought. Thus, an optimal educational curriculum would attempt to provide children with an orchestration of experiences using each form of the symbolic function.

The tie-in between the symbolic function and operativity suggests another requirement for an optimal curriculum. Such a curriculum would attempt to provide experiences for symbol formation in the context of the child's interests and concerns. Apart from the personal value of this goal, the cognitive value lies in the probability that more of a child's schemes will be coactivated in situations the child can relate to his ongoing experience. The more a child's schemes are coactivated, the greater the chance for reflective abstraction to occur.

Evaluating children's learning

While few adults have thought about operativity in the detail presented here, some adults are less bound in their world views by the figurative aspects of knowledge than others. That is, some adults are more able than others to recognize situations in which children are exercising their (operative) mental structures. Therefore, one finds a wide difference in the types of activities assumed by adults to promote learning in children.

As an illustration, consider a situation in which a young child, Steven, makes a plan to work in the art area where he will draw "a boat on a lake and a man fishing." Steven gets out crayons and paper for himself. He draws a fish. Next he draws a man inside a boat. Then he covers over the fish with blue lines, intended to be water. All of this activity takes about twenty minutes. When Steven has finished, his teacher asks him to tell her about his drawing. Steven says that he made a "man in a boat on the water and a fish in the water." A visitor to the school comments later on that she was glad Steven had remembered the fish he had drawn so carefully, even after he had covered it over with "water." In an intuitive manner, this visitor was able to discern some of the cognitive processes underlying Steven's performance. She realized the significance of his recalling the presence of the fish in the water; his recall demonstrated that he had not just absent-mindedly scribbled over the fish—he had realized that the fish would be invisible under the water, and he had used this knowledge in his drawing activity. In contrast, another visitor, someone less attuned to the thinking that goes on "beneath the surface" of a representation, observes only the figurative quality of the drawing itself, which leads him to the opinion that Steven had not learned how to represent a fish in water.

As another illustration of this difference in perspective, suppose visitors are observing two girls who are pretending they are sisters. In their pretend play, they take care to dress similarly and engage in the same activities. They walk around the classroom saying things like, "This is ours, not theirs." "We aren't doing that." "We live over there." Some observers may not perceive this as a learning activity, while others may have an intuitive idea that the children are engaging in mental classification of ways in which sisters are different from playmates in general. From the cognitive-developmental point of view, the opportunity to exercise classification schemes through such play is an important part of learning. Research has, in fact, demonstrated the intellectual value of dramatic play as well as the variability of adults' attitudes toward it.

Student philosopher and cognitive alien

When one generalizes from one's own experiences as an adult, many of the activities of children seem to be without intellectual value. However, once one becomes sensitized to the types of novel problems a child needs to solve in order to learn from experience, one comes to appreciate the intellectual quality of these activities.

I recall overhearing the conversation of two students after three weeks of a class on Piaget's theory. One student remarked that her eight-month-old baby had been spending long periods of time gazing at his raised feet while lying on his back in his crib. At first, she

said, she had thought this fascination reflected something subnormal about her son's intelligence. Then, she had remembered that the child had only recently become able to raise his feet so he could see them; maybe his fascination reflected his growing awareness of the interrelations of the parts of his body. The student went on to say that before this course in Piagetian theory it would never have occurred to her that a child needs to learn that those things we call "feet" behave in certain predictable ways. She concluded by saying that now she thought her son was quite a thinker.

The young child can be seen, paradoxically, as both a "student philosopher" and a "cognitive alien."* As a student philosopher, the child constructs, tests, revises, and reconstructs hypotheses about physical and social reality. As a cognitive alien, the child uses a repertoire of schemes that is qualitatively different from those an adult uses. These attributes, while referring specifically to the cognitive aspects of a child's personality, nevertheless permeate the child's life, since his ability to reason—in both senses, as "philosopher" and as "alien"—is inseparably linked with the social and emotional aspects of his personality.

An awareness of the ways in which children act the parts of student philosopher and cognitive alien can spark a teacher's appreciation of his students' ways of thinking and behaving. In so doing, it can help to broaden his concept of his own role as one who facilitates the child's movement toward maturity. An understanding of cognitive-developmental theory, and in particular of the differences between operative and figurative thought, can contribute significantly to such a widening of the arena of teaching. □

*Cf. David Elkind.[7]

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Data Processing at High/Scope

BOB HANVEY

THE VOLUME OF DATA generated by evaluations of educational programs and the complexity of the statistical procedures usually employed to analyze the data have made researchers dependent on the "number crunching" ability of computers to perform analyses on a timely basis. The task of converting the various tests, observations, rating scales, and questionnaires used by High/Scope researchers from raw data to computer files is handled by the data processing section of the Research Department. The projects which created the need for computers and data processing services were the Perry Preschool Project, the Curriculum Demonstration Project, the Carnegie Infant Education Project, and National Follow Through. These projects produced more data than could reasonably be analyzed by hand, so in 1968 arrangements were made to use the University of Michigan's computing center on a time-sharing basis. (Time-sharing is the simultaneous utilization of a single computer system by many users who share the cost according to their proportion of use.)

"Batch" was the only mode of operation used during this period. In batch mode the cards containing the data are taken by the user to the computing center where they are "read" and processed by the computer. At High/Scope, the cards were punched by research assistants until a supervisor was hired to oversee the data processing operation. The supervisor, a permanent staff member, was responsible for manually monitoring data collection and processing and for recruiting, hiring, and training a temporary staff for every data collection period.

To analyze data under this system, the researcher manually pulled cards out of a file drawer, assembled the cards in the order required by the programs used for data analysis, took the cards to the computing center (which was ten miles away), ran the programs, and then returned the cards to the file drawer. Duplicate decks were made in order to give several researchers access to the data at the same time. But as researchers discovered and corrected errors, added and deleted subjects, dropped and sorted decks of cards, the duplicate decks became originals. After about a year and a half on this system, the decision was made to solve the card-deck problems by going to a tape system.

Late in 1969 a computer programmer was assigned the task of designing, programming, and implementing a data storage and retrieval system. The system he designed was essentially a card-image-on-tape system with a common format for the child-identification information appended to the front of each tape record. The general pattern of data analysis remained unchanged. The manual process of pulling cards out of a file drawer was replaced by accessing a magnetic tape and requesting that the computer extract the data cards required for the particular analysis and store them in a temporary computer file.

By this time the University of Michigan had replaced its outmoded IBM 7090 with an IBM 360/67 with dual processors and a specially designed terminal-oriented system known as the Michigan Terminal System (MTS). The MTS system had built-in procedures the researchers could easily use to insert the run-control commands; under the old system these commands had to be inserted into the card decks by hand.

By May of 1970 the High/Scope system was operational, existing data had been entered into

the system, and an IBM 2741 communications terminal had been installed on-site at the Foundation. The on-site terminal enabled researchers to do all their analyses without leaving the Foundation. After about a year on the new system, the data processing supervisor decided that it would be more efficient to enter the data on-line than to punch cards and take them to the computing center, so this procedure was instituted.

In 1972 the University of Michigan Statistical Research Laboratory combined several of its statistical programs with a data management system and made the package available to all users of the computing center. This system was called the Michigan Interactive Data Analysis System, or MIDAS. MIDAS appeared to be a viable alternative to the High/Scope data storage and retrieval system, so, although the High/Scope projects that were already on the old system were maintained, several subsets of data were entered into this new system. High/Scope research staff quickly acquired the skills needed to use the MIDAS system and found it substantially easier to use than the old High/Scope system, except for the problem of constructing MIDAS files.

One of the problems in MIDAS file construction was the assumption that there would be data for the same number of subjects on all variables within a file. But for a large-scale project such as the national Home Start evaluation conducted by High/Scope, it is nearly impossible to collect every piece of data required from every subject in the sample. Therefore there must be some way to allow for missing data. During the Home Start evaluation, this problem was solved by developing a data collection monitoring system which could mechanically supply filler records for those subjects in the sample who were missing some data. After the raw data files were filled in so that each subject had a record for each variable, the data were entered into the MIDAS system using commands prepared by the data processing staff. The file that was released to the research staff was then complete and in the form of a MIDAS data base, which could be easily accessed. This division of labor put the tasks which require the most technical data processing knowledge in the hands of the data processing staff and gave the research staff more time to analyze the data.

During the Research Department's current evaluation of Project Developmental Continuity, this cooperative arrangement between data processors and researchers has been carried even further. In this evaluation, as in most large-scale national evaluations, when the bulk of the data from one testing period are received and processed and ready for analysis there are still a few subjects at several sites on whom data are delayed. It is known that the data can and will be collected and that the subjects will be included in the sample that is to be reported. However, since this is a new project that uses several fairly new instruments, a substantial amount of psychometric analysis is required. In order to give the researchers as much time as possible to complete their analyses, a data file is released to them when it is about 90% complete. The researchers are then able to explore the data, knowing that although it is incomplete and the figures produced cannot be reported, there is little chance that the remaining 10% of the sample will drastically alter the findings. Each instrument, then, is analyzed *as if* the data are complete, but the instructions required by the computer to analyze the data are saved in a file which can be used when the data are in fact complete. Then, as the remaining sample is received and the files completed for each variable, the data processing staff access the analysis instructions and produce the statistics that are to be reported. All of the data required to produce tables for the reports are saved in computer files and then accessed by the data processing staff in order to fill in preprinted forms prepared by a statistical typist.

As the procedures at High/Scope were changing so too was the equipment used to process the data. For the early projects, research staff recorded all data on punched cards and entered the data into the computer by going to the computing center and "reading" the cards on the university equipment. In 1970, when the IBM terminal was leased, some of the data were entered directly into the computer from the terminal via telephone lines to the computing center. Within the next two years High/Scope personnel had stopped punching cards and were entering all data through the terminal. While this system was more efficient than the previous one, it did have two major drawbacks: cost and computer accessibility. For this type of on-line data entry there is an hourly rate charged for being attached to the computer, and data can only be entered when the host computer is operating.

The problems of cost and accessibility were solved when two Texas Instruments Model 733 data terminals equipped with magnetic tape cassettes were acquired. Data could then be recorded on these tapes without having to use the computer, and the rate at which the operator entered the data had no effect on computer charges. When a tape was completed it was transmitted to the computer via telephone lines by "reading" back on the terminal connected to the computer. This operation had a relatively high transmission rate, so the computer charges were kept fairly low.

A recent piece of hardware acquired by High/Scope is a Texas Instruments 742, which appears outwardly to be almost identical to the 733. However, tucked inside the 742 is a small programmable computer. This allows for several error checks to be made while data are being entered. A wide range of errors can be detected while a test protocol is still in the hands of the data entry person. Errors discovered at this point can either be corrected and re-entered immediately, or if the error cannot be resolved by the operator, the protocol can be set aside, checked by the supervisor, and re-entered later. Under the old procedure the error would have been entered into the computer file and not been discovered until the data were analyzed and the test booklets filed away.

The 742 requires that programs be written specifically for each document being processed. It has been found that once the general procedure is worked out, the data entry person can easily learn to made modifications to fit the specific test requirements. There are some definite advantages in having the data entry person directly involved in the programming process. One of the main advantages is that this person is familiar with the documents being entered and often has insights into the problems encountered and can make provisions in the program to deal with them. In one case, insights provided by the data entry person led to program changes which nearly doubled the effective entry rate.

A look to the future of data processing at High/Scope reveals two major changes in the operation to be very likely. First, the type of test administered to children is likely to require a higher degree of computerization. This process has started already with High/Scope's Productive Language Assessment Tasks (PLAT). The codeable product of the PLAT is a story written by a child. During the first two years of PLAT data collection, the story variables were entered onto coding sheets and put into the computer in the usual way, but in the spring of 1975 about 2000 PLAT stories were entered directly into the computer by the coders. To score a child's story using this system, the entire text of the story is typed by the coder, corrections are made, and then the story is played back to the coder by the computer. The coder then examines each word of the story as the words are played back and applies a series of codes at appropriate places in the text. Then the computer prompts the coder for a series of variables describing the entire story. When this procedure is completed, the computer scans the coded text of the story and computes another series of variables.

This division of labor between the coder and the computer is set up so that each does what it is best at doing. The coder is able to make complex judgments such as parsing sentences, and the computer performs such tasks as counting the number of different words in the story. This provides the capability to score a test in a fairly short time while maintaining a high degree of accuracy and inter-coder reliability.

The second major change that is likely to occur in High/Scope's data processing operation is the acquisition of an in-house computer facility. Due to the size and complexity of some of the major evaluations undertaken by the Research Department, High/Scope will not be able to divorce itself completely from the powerful computer at the University of Michigan. However, there are a large number of tasks that require very little computing power, such as test-data monitoring and preparation of research tables, and these are well suited to "minicomputers." Several of the currently available minicomputers are powerful enough to handle PLAT processing, and since there is no connect-time charge with minicomputers, PLAT processing costs would be reduced.

Improvements in High/Scope's data processing equipment and procedures have been aimed at greater efficiency. Obtaining equipment such as the programmable data terminal has helped to reduce costs by increasing productivity while maintaining accuracy. Computer programs like the one designed for the PLAT have reduced time spent on coding, helped to increase inter-coder reliability, and made the construction of variables such as "number of different words" in a child's story economically feasible. Staff experience has also led to improvements in efficiency. For example, envelopes used for mailing data to High/Scope on each child being tested are now preprinted with a checklist of the possible contents; the tester in the field indicates on the checklist which tests are included in the envelope, and this allows the envelope to be used as a source document for the data monitoring system.

But efficiency is not limited to doing things faster and cheaper. The major focus of the changes in data processing equipment, procedures, and organization of the High/Scope Research Department has been to provide researchers with as much computer power as possible while keeping their need for data processing training at a minimum. Extending the capability of the Research Department's data processing section from the usual "getting the data on cards" to the construction and maintenance of a data base has freed High/Scope researchers from data processing tasks and thereby enabled them to devote more time and energy to data analysis and interpretation.□

Bob Hanvey is a computer programmer who coordinates the data processing section of the Research Department.

Notes & News

Evaluation Results Support High/Scope Preschool

The results from fall 1975 and spring 1976 administration of the McCarthy Scales of Children's Abilities (MSCA), a standardized aptitude test, show that children in the High/Scope Demonstration Preschool made considerably more progress than could be expected on the basis of maturation alone—children in the program gained 2.07 months in mental age for each month of preschool. The broad-based applicability of the preschool curriculum was demonstrated by the equivalence of gain scores among handicapped children, nonhandicapped lower-income and nonhandicapped middle-income children.

Time-sampled naturalistic observations were also made of preschoolers' general affective state and of social behaviors directed to, and received from, peers and teachers. The results of data analysis indicate that, on the whole, both children and teachers interacted with handicapped children in much the same way that they interacted with nonhandicapped children.

During the year, progress was made in the development of the Preschool Productive Language Assessment Tasks (PPLAT) and the Child Observation Record (COR), a set of observational categories for teachers' use in assessing aspects of child behaviors not readily obtained by other instruments.

Bilingual/Bicultural Preschool Project

Under a grant from the Office of Child Development and in collaboration with the Detroit Public Schools, the Foundation is continuing to develop, implement and validate a bilingual/bicultural preschool model, using as a basis the Cognitively Oriented Preschool Curriculum. Multimedia materials for teacher training and parent orientation and a management-dissemination plan are being prepared to facilitate nationwide replication in Head Start and other centers in which bilingual/bicultural children are enrolled.

High/Scope's orientation to bilingual/bicultural education stresses support for both the child's first and second languages and his culture. The model utilizes a naturalistic approach to language usage and language learning consistent with the cognitive-developmental philosophy.

In 1976-77, the model will be developed in cooperation with the Detroit Public Schools' Head Start Program. During 1978 additional replication sites are planned in the Southwest and on the eastern seaboard.

"First Chance" Conference

The High/Scope First Chance Demonstration Preschool Project hosted a conference on "The Cognitively Oriented Curriculum and Preschool Children with Special Needs" in October 1976. The conference examined the problem of mixing handicapped and nonhandicapped children in preschool classrooms. The focus was on the use of an "open framework" curriculum to provide an optimal learning environment and developmentally appropriate learning activities for all children.

Visitors' Days at High/Scope

People concerned with the education of young children are invited to observe High/Scope's Preschool and Elementary & Middle School during special visitors' days. For information and reservations call Nelda Schlabach at (313) 485-2000.

Foundation to Train Teachers in Detroit Public Schools

High/Scope has entered into a three-year agreement with Region Four of the Detroit Public School System to establish a staff development and training program to implement the Cognitively Oriented Curriculum. The Vetal Elementary School, grades K-6, will be the focus of this effort. Dr. Paul Hovsepian, Region Four's Curriculum Supervisor, sees the Foundation's contribution as a supportive element in the ongoing effort of the Region's parents, teachers, board members and administrators to offer alternatives to the traditional learning-teaching process.

High/Scope Graduate Program Begins in Fall 1976

The High/Scope Foundation is offering a one-year training program for qualified college graduates beginning in the fall of 1976. The purpose of this Graduate Program in Education & Human Development is "to enable individuals to implement a cognitive-developmental (Open Framework) approach to education, as exemplified by the High/Scope Cognitively Oriented Curriculum."

The Graduate Program is open to anyone with a Bachelor of Arts or Science degree who is seriously interested in educational innovation from a cognitive-developmental viewpoint. Graduate credit may be earned for courses in the Graduate Program through cooperative arrangements with Pacific Oaks College, Pasadena, California and the Merrill-Palmer Institute, Detroit.

The Graduate Program's educational priority is to provide a program that is adapted to the needs of each student-teacher through practical teaching experience at the High/Scope laboratory school, seminars led by Foundation staff and self-directed student projects.

For more information write or call the Graduate Program Coordinator.

Parent-to-Parent Project

The Parent-Infant Education Department has completed the first year of its home-visitor-training and delivery-system-development projects, funded by the National Institute of Mental Health and the Lilly Endowment. Efforts this year have focused on training and operation of a community-based home visit program, in which four Ypsilanti parents, participants in previous High/Scope home visit projects, are now working as home visitors with other parents. They are using the High/Scope parent-infant education model in their weekly sessions with each family—helping parents to understand and support their babies' growth. Plans and outlines have been developed for the completion of disseminable written and audio-visual materials for the training and delivery model.

New Videotapes on Parent-Infant Education

Final revised versions of two parent-infant education videotapes have been produced and are available to the public. *Babies and Their Parents—An Overview of the High/Scope Approach* is an introduction to the goals, beliefs and assumptions that underlie the Foundation's work with parents and infants. It is suitable for orientation or group discussion structured around its three main sections—"Babies as Active Learners," "Skills and Stages in Infancy" and "Supporting Early Learning." *Causing Events to Occur—The Development of Causality* illustrates, in nontechnical language, the sequences and experiences through which babies come to understand and control causal relations in the world around them. Examples include learning through interaction with people and through exploratory play. This program is designed for parents, students of child development and persons being trained for work with parents or infants.

Spanish-Language Curriculum Workshops

Under contract with the School of Education of the University of Chile, in July 1976 two High/Scope consultants presented a series of curriculum workshops to groups of university professors and other key people from a variety of early childhood projects in Chile. A Spanish-language multimedia package on the Cognitively Oriented Preschool Curriculum was used in the workshops. Further information on Spanish-language workshops and materials is available from the Foundation's International Programs division.

Home Start Report Published

The Final Report of the National Home Start Evaluation (1972-75) has been published. A limited number of copies are available at four dollars. Address orders or inquiries to the Administration Department.

Home Start Follow-up Study Begins

The Foundation has been awarded a contract by the U.S. Office of Child Development to conduct a follow-up study of Home Start families and to evaluate six regional Home Start Training Centers. The primary purpose of this effort is to provide information to decision-makers for future policy decisions about family intervention programs and processes for training personnel to work in home-based programs. High/Scope, as prime contractor, will provide overall direction to the project and will take primary responsibility for the Training Centers Evaluation. Abt Associates, Inc., of Cambridge, Massachusetts, as subcontractor, will have primary responsibility for the follow-up study of the six sites from the national Home Start demonstration that took part in the "summative" evaluation of that project.

Six regional Training Centers that are currently funded by the Office of Child Development to train home-visiting and supervisory staff from programs in their regions will participate in the Training Centers Evaluation. This evaluation will (a) collect information to describe the activities of the Training Centers, (b) conduct a survey to determine whether the Training Centers are meeting the needs of Head Start programs for training staff to work in home-based programs, (c) analyze training sessions and interview trainers and trainees to evaluate the effectiveness of training, and (d) analyze the costs of operating this regional network of Training Centers. The evaluation study is scheduled to be completed by January 1978.

Journal Devotes Special Edition to High/Scope Curriculum

The *Revista de Educacion Pre-Escolar*, a journal on early childhood education published by the Fundacion de Jardines Infantiles of Santiago, Chile, recently published a special edition devoted to their work in applying the Cognitively Oriented Curriculum to Chilean preschools serving children from families in extreme poverty.

Conference Draws Participants from 30 States

High/Scope's annual conference on the Cognitively Oriented Curriculum was held in Ann Arbor in May 1976. Participants from 30 states were welcomed by President David P. Weikart, who reviewed the longitudinal results of High/Scope's early intervention projects for young children. Staff from the Parent-Infant, Preschool and Elementary Education departments conducted two days of workshop sessions explaining the curriculum and illustrating practical approaches for home visitors, preschool and elementary educators, parents and administrators. Evening workshops were held to acquaint participants with High/Scope's approach to bilingual/bicultural education, the summer camp program for teenagers, the Productive Language Assessment Tasks, the integration of handicapped with non-handicapped preschool children and the construction of simple toys for infants and young children.

Planning for the 1977 spring conference to be held in Ann Arbor is underway. Persons interested in receiving registration information should contact the Foundation's Administration Department.

Australian Educator Completes Post-Doctoral at High/Scope

Dr. Eddie Braggett, a Senior Lecturer in Education at the University of Newcastle in New South Wales, Australia, recently completed a six-month post-doctoral fellowship at the Foundation. As an invited "participant-observer," Dr. Braggett assumed an active and productive role in a variety of High/Scope activities.

His major involvement centered on the Project Developmental Continuity (PDC) evaluation that is being conducted by the Research Department. As a member of High/Scope's field team, Dr. Braggett traveled to PDC sites in California, Iowa and West Virginia, interviewing PDC staff, teachers and school administrators and observing in the classrooms. Dr. Braggett's other PDC-related research efforts included conducting a literature search and writing a paper on "Factors Which Enhance or Retard Change and Innovation in Education," formulating hypotheses related to PDC program inplementation and contributing to PDC report writing and data analysis.

During his stay, Dr. Braggett made important contributions to the Foundation while increasing his knowledge of American education. Members of the High/Scope staff who had the privilege of working with Dr. Braggett will remember him as an educator whose seriousness of purpose was imbued with warmth, wit and a spirit of fellowship.

HIGH/SCOPE'S
ANNUAL SPRING CONFERENCE

on the

COGNITIVELY ORIENTED CURRICULUM

for Infant, Preschool & Elementary Education

will be held in Ann Arbor
in May, 1977

PLAN NOW TO ATTEND

☐ I plan to attend. Please send registration materials.

☐ I would like more information.

Name_____

Address_____

Spring Conference
High/Scope Foundation
600 North River Street
Ypsilanti, Michigan 48197

High/Scope Camp

A Summer Program
for Teenagers

Founded in 1963 on a 385-acre estate near Clinton, Michigan, the High Scope camp is now an official program of the High Scope Foundation. Boys and girls from 12 to 18 years of age, from a variety of social, racial and religious backgrounds, spend 8 weeks together as a multi-age unit in this unique summer program of arts and sciences and group living. In past summers, young people from communities throughout the United States and from Norway, Germany, England, Austria, Chile, Peru, Colombia and Australia have participated in the High Scope summer program.

☐ Please send application forms.
☐ Please send more information.

Name

Address

High Scope Camp
High Scope Foundation
600 North River Street
Ypsilanti, Michigan 48197

Financial Statements

INCOME SOURCES FOR THE HIGH/SCOPE FOUNDATION

The Foundation received $1,946,388 in grants, contracts and gifts for the year ended June 30, 1975, a 10.6% increase over the previous year's income of $1,759,331. These funds were received from both private and public supporters. New grants were received from the Bureau of Education for the Handicapped, the Lilly Endowment, the Office of Child Development and from school districts.

	FY 1975	FY 1974	FY 1973	FY 1972	FY 1971
Total Income	$1,946,388	$1,759,331	$1,412,057	$1,120,059	$801,672
Office of Child Development	1,058,318	708,385	269,213	197,268	152,321
Office of Education	579,966	688,030	552,862	270,875	201,220
School Districts	23,605	113,890	120,300	353,106	273,350
Office of Economic Opportunity			74,011	62,070	31,720
National Institute of Mental Health				9,823	29,460
Carnegie Corporation	54,720		111,607	117,229	60,164
Spencer Foundation		106,800	107,189	78,059	
Grant Foundation		25,000	60,000		
Ford Foundation		12,000			
Lilly Endowment, Inc.	100,000				
Other	129,779	105,226	116,875	31,629	53,437

HIGH/SCOPE EDUCATIONAL RESEARCH FOUNDATION
BALANCE SHEET
June 30, 1975

	Total Federal Programs	Total Non-Federal Programs	Total All Programs
ASSETS			
CURRENT ASSETS			
Cash in Banks and on hand	($ 72,912.46)	$ 96,441.32	$ 23,528.86
Time certificates — including interest receivable of $840.39	—	143,158.55	143,158.55
Accounts receivable	166,396.96	33,794.10	200,191.06
Prepaid expenses	—	4,298.40	4,298.40
Deposits and advances receivable — Note G	—	10,499.52	10,499.52
TOTAL CURRENT ASSETS	$ 93,484.50	$288,191.89	$381,676.39
PROPERTY AND EQUIPMENT — on the basis of cost — Notes A, B, & G			
Land	$ —	$ 25,667.00	$ 25,667.00
Land improvements	—	15,259.69	15,259.69
Buildings and improvements	—	95,672.21	95,672.21
Equipment	16,625.70	140,208.60	156,834.30
Allowance for depreciation (deduction)	(5,469.32)	(79,057.17)	(84,526.49)
	$ 11,156.38	$197,750.33	$208,906.71
	$104,640.88	$485,942.22	$590,583.10
LIABILITIES AND FUND BALANCE			
CURRENT LIABILITIES			
Accounts payable	$ 97,848.37	$ 16,195.22	$114,043.59
Accrued salaries and amounts withheld therefrom	11,846.70	—	11,846.70
Reserve for fringe benefit liabilities — Note C and D	37,025.38	6,976.28	44,001.66
Current portion of long-term debt	—	4,000.00	4,000.00
TOTAL CURRENT LIABILITIES	$146,720.45	$ 27,171.50	$173,891.95
LONG-TERM DEBT — less portion classified as current liability — Note E	—	16,960.62	16,960.62
DEFERRED REVENUE — Note F	—	50,200.70	50,200.70
TOTAL LIABILITIES	$146,720.45	$ 94,332.82	$241,053.27
FUND BALANCE			
Balance at July 1, 1974	($ 44,198.63)	$322,411.54	$278,212.91
Excess of revenues over expenditures (expenditures over revenues)	2,119.06	69,197.86	71,316.92
Balance at June 30, 1975	($ 42,079.57)	$391,609.40	$349,529.83
	$104,640.88	$485,942.22	$590,583.10

HIGH/SCOPE EDUCATIONAL RESEARCH FOUNDATION
STATEMENT OF REVENUES AND EXPENDITURES
June 30, 1975

	Total Federal Programs	Total Non-Federal Programs	Total All Programs
REVENUES:			
Contracts and grants	$1,638,283.62	$197,374.72	$1,835,658.34
Management fee income	—	30,168.91	30,168.91
Miscellaneous	—	80,560.65	80,560.65
	$1,638,283.62	$308,104.28	$1,946,387.90
EXPENDITURES:			
Personnel costs	$ 721,342.68	$138,218.66	$ 859,561.34
Travel	56,850.72	18,543.07	75,393.79
Equipment rental	6,101.33	132.37	6,233.70
Equipment purchased	505.40	27,231.09	27,736.49
Testing	23,063.35	1,976.38	25,039.73
Printing	4,798.74	4,492.07	9,290.81
Repairs and maintenance-equipment	3,775.22	106.50	3,881.72
Audio-visual	(34.97)	—	(34.97)
Consulting	12,648.90	145.20	12,794.10
Workshop	5,284.35	6,305.30	11,589.65
Supplies	26,025.54	4,501.99	30,527.53
Computer services	39,825.04	3,837.11	43,662.15
Vehicle operations	—	118.00	118.00
Occupancy costs	12,913.90	3,753.26	16,667.16
Depreciation	—	2,583.57	2,583.57
Sub-contracts	479,464.74	—	479,464.74
Films	—	4,118.25	4,118.25
Interest	—	1,643.30	1,643.30
Telephone	3,712.21	743.36	4,455.57
Insurance	—	440.84	440.84
Lab transfers	11,261.47	6,000.00	17,261.47
Building maintenance	1,286.09	214.68	1,500.77
Management fees	30,168.91	—	30,168.91
Allocated indirect costs	203,506.66	40,975.26	244,481.92
TOTALS	$1,642,500.28	$266,080.26	$1,908,580.54
Plus (Less):			
Transfer to fixed assets	($ 6,335.72)	($ 27,173.84)	$ 33,509.56)
TOTAL EXPENDITURES	$1,636,164.56	$238,906.42	$1,875,070.98
EXCESS OF REVENUES OVER EXPENDITURES (EXPENDITURES OVER REVENUE)	$ 2,119.06	$ 69,197.86	$ 71,316.92

HIGH/SCOPE EDUCATIONAL RESEARCH FOUNDATION

STATEMENT OF CHANGES IN FINANCIAL POSITION

July 1, 1974 to June 30, 1975

Funds Provided by:		
Net excess of revenues over expenditures for the year		$ 71,316.92
Items recognized in operations which did not affect working capital in the current period —		
Depreciation — Note A	$24,772.39	
Increase in deferred revenue	40,544.05	65,316.44
Funds Provided from Operations		$136,633.36
Net book value of equipment disposed		4,678.00
Total Funds Provided		$141,311.36
Funds Used for:		
Expenditures for property, land improvements, and equipment (net of equipment)		$ 33,509.56
Decrease in long-term debt		4,004.86
Total Funds Used		$ 37,514.42
Increase in Working Capital		$103,796.94
Changes in Components in Working Capital		
Increase (Decrease) in Current Assets:		
Cash and time certificates		$ 98,063.97
Accounts receivable		227.90
Prepaid expenses and other current assets		10,412.71
Increase (Decrease) in Current Assets		$108,704.58
Increase (Decrease) in Current Liabilities:		
Accounts payable		($ 21,680.98)
Accrued salaries and amounts withheld therefrom		6,575.59
Reserve for fringe benefits		19,813.03
Current portion of long-term debt		200.00
Increase (Decrease) in Current Liabilities		$ 4,907.64
Increase (Decrease) in Working Capital		$103,796.94

HIGH/SCOPE EDUCATIONAL RESEARCH FOUNDATION
NOTES TO FINANCIAL STATEMENTS
June 30, 1975

NOTE A — ACCOUNTING POLICIES
Equipment and properties which have been purchased by the Foundation from budget appropriations and from land contract purchase are capitalized and depreciation is charged on the straight-line method to the operations accounts using various estimated useful lives.

The Commissioner of Internal Revenue has notified the Foundation that it is exempt from Federal income taxes.

The Foundation makes matching contributions toward individual employee retirement annuity plans. At June 30, 1975, there are no unfunded liabilities for these plans.

NOTE B — LEASES
The Foundation has entered into certain leases related to office space which expire in 1976. These leases call for monthly rents totaling $2,000.00. One of the leases calls for the Foundation to reimburse the lessor for any excess of current real estate taxes over those paid in 1973. As of June 30, 1975, the approximate amount due for such taxes is $700.00. This liability has not been recognized in the financial statement. The Foundation has received approval to terminate these leases early, with no penalty.

The Foundation has leased equipment with an option to purchase (for $303.50) at the end of the lease. The Foundation has subsequent to June 30, 1975 exercised its option and thus the lease payments ($5,942.72) together with the option price has been capitalized at June 30, 1975.

NOTE C — RESERVE FOR FRINGE BENEFITS
The Foundation has established a policy to fund a reserve to cover the following costs:

1. Personal and sick leave earned but not used in a fiscal year.
2. Costs incurred when a staff member is terminated without a 90 day notice.
3. Unemployment benefit liability (See Note D).

This reserve is being funded by assessing each grant and contract for 4% of salaries and wages. The total addition to the reserve in the current year is $33,500.44. The total charge against the reserve is $13,687.41.

As of June 30, 1975, the contingent liability for personal and sick leave is $41,000.00 and $56,000.00, respectively.

NOTE D — UNEMPLOYMENT TAXES
On January 1, 1972, the Foundation became subject to the Michigan Unemployment tax. The Foundation has elected the reimbursement method, in which it must reimburse the State for all claims paid. The Foundation is funding this liability as discussed in Note C above.

NOTE E — LONG-TERM DEBT
At June 30, 1975, the Foundation had a long-term debt consisting of a 7% land contract, payable in quarterly payments of $1,360.00 including interest, to be paid in full by December, 1979.

NOTE F — DEFERRED REVENUE
The Robert Sterling Clark Foundation awarded a grant of $10,000.00, of which $680.68 was recognized as revenue in fiscal year ended June 30, 1975, with $9,319.32 to be recognized in the next fiscal year.

The Carnegie Corporation of New York awarded a grant to the Foundation for a study of the long-term impact of early education programs for disadvantaged children. The total grant is for $322,400.00. In the fiscal year ended June 30, 1975, the Foundation received $43,400.00 and recognized $22,120.67, with $21,279.33 to be recognized in the next fiscal year.

The Foundation has an agreement with the United Presbytarian Metropolitan Children's Center of Indianapolis, Indiana to provide technical assistance. For the fiscal year ended June 30, 1975, the Foundation received $3,750.00 and recognized $2,500.00, with $1,250.00 to be recognized in the next fiscal year.

On June 1, 1975, the Foundation took over the operation of the High Scope, Inc. summer camp program. In fiscal year ended June 20, 1975, camper fees of $21,050.00 were received and $2,697.95 was recognized, with $18,352.05 to be recognized in the next fiscal year.

NOTE G — COMMITMENTS
The Foundation has made agreement to purchase two buildings. The purchase price of one is $250,000.00, to be financed with a 7% land contract of $220,000.00, with monthly payments of $1,706.00. Closing is to take place on September 1, 1975. The second building is to be purchased for $17,000.00, with full payment at the closing on July 15, 1975.

AUDITOR'S REPORT

Board of Directors
High Scope Educational Research Foundation

We have examined the Balance Sheet of High/Scope Educational Research Foundation as of June 30, 1975, and the related Statements of Revenues and Expenditures and of Changes in Financial Position for the year then ended. Our examination was made in accordance with generally accepted auditing standards and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances.

In our opinion, the aforementioned financial statements present fairly the financial position of High/Scope Educational Research Foundation at June 30, 1975, and the results of operations, changes in fund balance, and changes in financial position for the year then ended, in conformity with generally accepted accounting principles, applied on a basis consistent with that of the preceding year.

CURTIS, BAILEY, EXELBY & SPOSITO, P.C.

Ypsilanti, Michigan
August 15, 1975

continued from inside front cover

sessment procedures to supplement or replace standard measures of children's achievement and intelligence. Evaluation of children's productive-language competence is one example; this is part of a promising approach to ecologically valid measurement that aims at assessing educational outcomes relevant to important life situations. Research staff are also developing and using observation instruments to discover what really happens in classrooms and how parents and children interact.

An important function of the Research Department is to conduct longitudinal studies to determine the long-range effects of educational programs on children's lives in school. These follow-up studies are being conducted for the Foundation's infant and preschool programs. Longitudinal follow-up of children from the preschool programs has been ongoing for more than a decade, with consistently encouraging results.

The Foundation also conducts evaluative research on programs other than its own. At the request of the federal Office of Economic Opportunity, research staff prepared an experimental design for a national day care study. Research staff have recently completed an evaluation of the Home Start Demonstration Project, a federal project that provided education in the home for preschool-age children from low-income families. A follow-up study on Home Start is now underway. Project Development Continuity is another national effort being evaluated by the Foundation; the aim of this project is to provide a continuous educational experience for four- to eight-year-old children and their families by linking Head Start and elementary-school programs.

○ *Latin American Projects*—The Foundation has been active in Latin America for the past five years. In Colombia, High/Scope staff have helped to design and support experimental infant and preschool programs with the Colombian Institute of Family Welfare and the Human Ecological Research Station. In 1974, the Foundation was asked by UNICEF to provide a series of training programs for officials of the Peruvian Ministry of Education and other professionals working with infants and preschoolers in Peru. Several Chilean educators have come to the Foundation for training in the Cognitively Oriented Curriculum, and High/Scope consultants have given workshops and seminars in Chile; as a result of these contacts, widespread interest in the Foundation and its programs has been generated in Chile. Preschool educators in Santiago are building programs around the principles of cognitively oriented education, and the Chilean Office of Nutrition has asked High/Scope to supply information to help facilitiate the blending of nutritional and educational stimulation in programs for disadvantaged infants and preschoolers. Other projects in Guatemala, Venezuela, Colombia, Peru and Chile are in the planning stages.